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THREE KINDS OF COURAGE.

There's the courage that nerves you in starting to climb
The mount of success rising sheer;
And when you've slipped back, there's the courage sublime
That keeps you from shedding a tear.

These two kinds of courage, I give you my word,
Are worthy of tribute—but then,
You'll not reach the summit unless you've the third—
The courage of try-it-again!

—Roy Farrell Greene.

Some Astonishing Statistics.

Few Americans need to be told that the United States leads the world in nearly all—if not all—lines of commercial achievement; but now and then figures are placed before one that bring that fact home with startling force. In commenting on the statement that New York now has 500,000 telephones, the Times of that city recalls statistics of this nature which are worth repeating, showing how far ahead of the rest of the world is this country in the matter of telephone development. London, with twice New York's population, has but 235,000 telephones, Berlin has 210,000 and Paris, the gay city, only 92,000. The United States has seven times as many telephone stations as Germany, and has 15,649,000 miles of wire as against only 2,733,700 for the Empire. Of the 19,000,000,000 telephone messages in the whole world for the year 1912, Uncle Sam's domain furnished 13,229,900,000. Although the United States contains but five per cent. of the population of the globe, this country has sixty-nine per cent. of the world's telephones and sixty-five per cent. of the telephone mileage.

These are mighty figures and constitute an impressive tribute to the energy of the American telephone man, and show that the American people are keen for modern, time-saving utilities.

Independent telephone men are entitled to the lion's share of the credit for this wonderful development. It was not until they entered the field that the public was adequately supplied with efficient telephone service, at reasonable rates, and that this useful invention reached its greatest usefulness. Of course, a great metropolitan newspaper like the New York Times is not expected to know anything about the work done in this direction by the Independents, for most New York journalists think the Indians still ravage the region west of the Allegheny mountains. The fact remains, however, that the telephone did not reach its golden age until the Independents began to build in every nook and corner of this wide country.

Mixers and Filters of Electricity.

Most telephone men know in a general way, the functions of repeating, impedance, and retardation coils as used in telephone work, but they cannot explain the theory involved in their uses. To the beginner in telephone work and to the student, the uses of the various coils are a puzzle. When they seek information from others, they find it extremely difficult to obtain satisfactory answers to their questions. They are told that alternating and direct current can be sent over the same circuit at the same time but, when they ask as to the methods used for separating the different currents so that they can be used for special purposes, the responses received are not very lucid. About all that they can learn is that the currents are separated and that certain apparatus is operated as a result.

In an article on another page, Arthur Bessey Smith describes the method by which alternating and direct currents are mixed at one end of the circuit and separated at the other. The operation of these mixers and filters of electricity in telephone work is taken up and clearly explained. It is indeed an interesting article and covers many points which are seldom seen in print, although encountered in everyday practice.

You and Some Real Americans

By HERBERT KAUFMAN

Yesterday the Italian bootblack at the corner stumbled through the details of his first real estate venture and took title to his new home.

Last Wednesday Demetreios, the Greek florist, bought the flat above his shop and became landlord to the three families upstairs.

There's a new boy on grocer's delivery wagon. The old driver has struck out for himself. The sign painter is lettering his name over a new delicatessen, and hereafter he'll be an employer of men.

An ex-peddler and his architect will lay plans tomorrow for a half million dollar hotel. A farm boy became president of an automobile company.

What do you own? What have you done? How far have you progressed? Who's the better man of the two, you or your father? Tut, tut, tut—it isn't the "fault of the times."

If the world were a harder world; if there were fewer chances; if success is more difficult today than in the past, uneducated immigrants, untrained country boys, sons of laborers, and children of paupers, could not buy real estate, conduct department stores, and manage corporations.

Go to any medical school and note the earnest, dogged young men who have scrimped and saved from their puny pay envelopes, until they collected the price of freedom from the thrall of stockroom, and counter, and machine shop.

They're denying themselves a paltry pleasure or so—eating and sleeping a little less than you—glad to stand the gaff while earning the right to rise to their possibilities; poring over law books after hours; studying chemistry; experimenting with electricity; living constantly within their wages; translating every possible penny, nickel, and dime into a textbook or a lecture course, or a tool, or test tube, determined to be somebody and to do something.

These men are real Americans. Theirs is the type that dared and did, through the hundred glorious years in which a puny colony grew into the master nation.

It is by them that the fires of imagination are kept burning. It is by them that new dreams are flung at tomorrow. It is by them that the reckless expenditures of time, and money, and vitality by such as you, are counteracted and a normal balance maintained in the life of the republic.

Every opportunity which they seize, every step of advancement which they take, every profit which they make, every success which they realize, lay within your possibilities.

Handicapped by foreign birth, by ignorance, by inferior physiques, they shame you, the native born, with your heritage of breed and education, with the memory of a thousand splendid yesterdays to inspire and guide you. Now your children scoff at their sons and daughters. Take care that tomorrow they do not serve them.

Wake up! Compete! Don't cry for a chance. Take pattern from the man below and try for it.

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Mixers and Filters of Electricity—Their Uses in Telephony

The Nature of Currents and Results of Mixing Different Kinds of Currents—Type of Mixers and Screens—Practical Uses of Mixers and Filters in Common Battery Telephones and General Telephone Transmission Circuits—Their Efficiency

By Arthur Bessey Smith

We are dealing with an agent of great flexibility. For variety of uses, ease of transmission, and facility of transformation, it is hard to find the equal of electricity. We generate practically all of it as alternating current. Much of it is immediately commutated into direct current for use close at hand. The greater portion is transformed to higher pressure, transmitted some distance, reduced in pressure, and delivered for use.

Both alternating and direct current can be transmitted over the same circuit at the same time. At the receiving end of the circuit, each kind of current can be separated from the other and caused to do whatever work is desired. Further, alternating current may be transmitted one way and direct current the other way and each separated as before. It is the purpose to show in this article, the means by which alternating and direct currents may be mixed and then filtered, and some of the practical uses to which this is put.

Direct current flows in one direction without change of strength, as is illustrated by Fig. 1-*A*. Suppose that all distances measured from "O" to the right, represent time in seconds, and distances measured up and down, represent current in amperes. Since direct current does not become

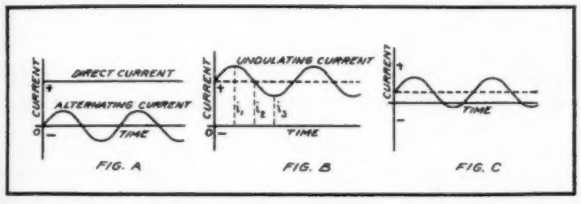


Fig. 1. Natures of Currents and Results of Mixing Them.

stronger or weaker, but is constant, it is shown by the horizontal line marked "direct current."

Alternating current flows first (positively) around the circuit. Then it reverses and flows in the opposite or negative direction. This is shown by the wavy line which rises above and falls below the zero line. When it crosses the line, the current is zero. Below the line, the current is flowing negatively around the circuit; above the line in a positive direction.

If alternating current and direct current be mixed, undulating current will be obtained, if the amplitude of the former be not too great. This is shown in Fig. 1-*B*. The heavy wavy line marked "undulating current" is the actual current which flows in the line. The vertical dotted lines, i_1, i_2, and i_3, indicate that the number of amperes flowing, varies from instant to instant, but always flows in the same direction. In Fig. 1-*C* is shown the result when the direct current is somewhat weak, so that there is a little reverse flow. Both of these compound waves may be separated at the receiving end of the transmission line.

Four fundamental types of mixers are shown in Figs. 2 and 3-*A* inclusive. Type 1, Fig. 2-*A*, consists of a rheostat in series with a direct current generataor, such as a battery. As long as the rheostat remains in one condition, the current sent out is direct. When the rheostat is moved so that its resistance is increased and decreased periodically, the current will fall and rise, becoming an undulating current.

Type 2, Fig. 2-*B*, consists of an alternating current generator in series with a direct current generator, such as a battery. The total voltage delivered to the line is the algebraic sum of the voltages of the two generators. Part of the time they aid each other and part of the time they oppose each other. The result is a compound current like that shown in

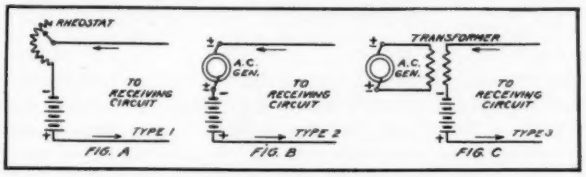


Fig. 2. Some Types of Current Mixers.

Figs. 1-*B* and 1-*C*, which flows over the line and through the receiving circuits.

Type 3, Fig. 2-*C*, employs a transformer to separate the alternating current generator from the transmission line. Aside from this it is the same as Type 2.

Type 4, Fig. 3-*A*, is a parallel arrangement. The two generators are in shunt with each other. To prevent direct current from entering the alternating current generator, a condenser is inserted between it and the transmission line. It should have a suitable capacity to reduce the loss of alternating current power. To prevent the alternating current from passing through the direct current generator, a retardation or impedance coil is cut in series with it. The coil should have as low resistance and as high inductance as possible. The low resistance is to reduce the energy loss of direct current. The inductance is used to choke out the alternating current, practically none of it passing through.

Six fundamental types of filters or screens are shown in Figs. 3-*B* and 4. Type 1, Fig. 3-*B*, consists of a condenser in series with the alternating current load. The condenser keeps out the direct current, but permits alternating current to flow. If the load be non-inductive, the condenser should be large enough to reduce the alternating current loss in it to a reasonable amount. If the load be inductive and the current has but one frequency, the condenser should be of such a size as will give resonance. Thus only the ohmic resistance of the load will remain, the reactance being neutralized. If L =

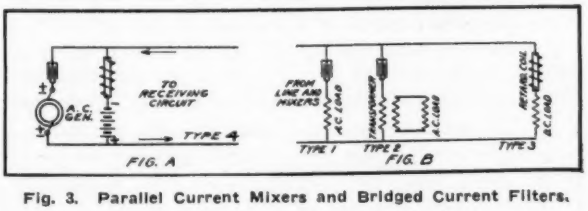


Fig. 3. Parallel Current Mixers and Bridged Current Filters.

inductance of load, f = frequency in cycles per second, π = 3.1416, and C = capacity of condenser in farads, then

$$C = \frac{1}{4\pi^2 f^2 L} = \frac{1}{39.47\, f^2 L}$$

The inductance, L, of most alternating current loads is not constant, but varies with the conditions.

Type 2, Fig. 3-*B*, is similar to the Type 1, except that a transformer is inserted between the load and the condenser.

This is done when it is necessary to have the alternating current load entirely insulated from the combined circuit, or from the direct current load.

Type 3, Fig. 3-*B*, consists of a retardation coil is series with the direct current load. It should have high inductance and low resistance. The high inductance keeps out the alternating

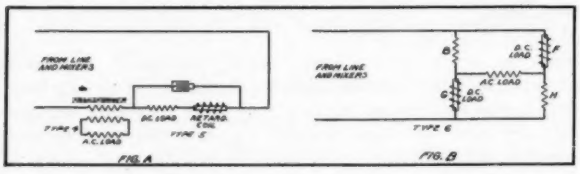


Fig. 4. Types of Series Filters and a Special Filter.

current. The low resistance prevents much loss of direct current power. Under certain conditions the retardation coil may be combined with the direct current load. It often happens that the direct current load has sufficient inductance to keep out alternating current without any separate retardation coil.

Type 4, Fig. 4-*A*, consists of a series transformer inserted in the main circuit. The entire undulating current flows through it. The electromotive force generated in the secondary winding is determined by the variation in current strength, so that the direct portion of the current is not repeated. The alternating portion of the current is transformed and delivered to the alternating current load. The primary winding should have as low resistance as possible for the sake of efficiency of both direct and alternating current power.

Type 5, Fig. 4-*A*, consists of a retardation coil and the direct current load in series, shunted by a condenser. The latter should be of fairly high capacity to secure small loss of alternating current power. The retardation coil should have high inductance and low resistance for the reasons given above. The load and coil are often combined in one piece of apparatus.

Type 6, Fig. 4-*B*, is an adaptation of the Wheatstone bridge. The direct current load is in two parts and occupies diagonally opposite positions. Two non-inductive resistances form the other two arms of the bridge. The alternating current load is in the position corresponding to the galvanometer. Direct current is kept out of the alternating current load by virtue of the balance of resistances, $\frac{B}{F} = \frac{G}{H}$ which is the same as saying that B is to F as G is to H.

Alternating current is kept out of the direct current load by the inductance of the latter. This is essentially a wasteful method of separating the two kinds of current. The non-inductive coils, B and H, carry undulating current, and the energy loss due to their resistance is complete.

The telephone transmitter is a mixer of Type 1, Fig. 2-*A*. The granular carbon between the carbon disks forms a resistance which is varied by the pressure of the diaphragm. The latter is controlled by the sound waves in air which strike

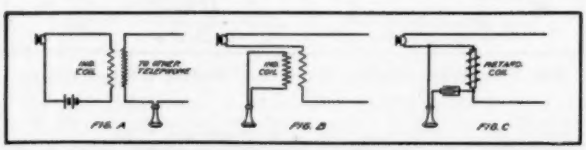


Fig. 5. Transmitter as a Mixer, Induction Coil as Filter.

the diaphragm. Fundamentally, it is a rheostat whose operating handle (the diaphragm) is moved by the air. In the local battery telephone circuit, Fig. 5-*A*, the variations in resistance of the transmitter cause the battery current to become undulating. It is therefore a compound current and may be resolved into alternating current and direct current. The induction coil repeats the alternating portion into the secondary circuit. It is a filter of Type 4, Fig. 4-*A*.

Each common battery telephone consists essentially of a mixer and a filter. The mixer is the transmitter, and has been already treated. The filter is to separate the received alternating current from the direct curent and deliver the former to the receiver. In some cases the telephone receiver is in reality a single phase, synchronous motor, capable of working on a wide range of frequencies. The non-polarized receiver is a single phase, synchronous motor, but for correct speech reproduction requires to be worked by a compound (undulating) current. The electric energy which it reproduces into sound waves in air, comes from the alternating current portion only.

The induction coil type of common battery telephone, Fig. 5-*B*, has for a filter, a transformer. It conforms to Type 4, Fig. 4-*A*. The polarized receiver should not have direct current flowing through it, and this is the reason for the many types of filters used in telephones.

The Kellogg common battery telephone, Fig. 5-*C*, has a filter of Types 1 and 3, Fig. 3-*B*, combined. The retardation coil, Fig. 5-*C*, merely allows the direct current to pass, but chokes out the alternating current, forcing the greater portion of it to pass through the condenser and receiver. The retardation coil has no other work to perform.

The Western Electric common battery telephone, Fig. 6-*A*, is a combination of several simple elements. Its transmitter is a mixer of Types 1 and 3. For receiving speech it combines filters of Types 1 and 4. If the set were stripped of

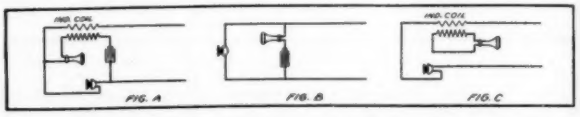


Fig. 6. Common Battery Circuit and Elements of W. E. Receiving Circuit.

everything except those parts necessary for the Type 1 filter, it would give the circuit shown in Fig. 6-*B*. The receiver is the alternating current load and is bridged across the line with a condenser to keep out the direct current. The Type 4 filter is shown in Fig. 6-*C*, where the energy is repeated to the receiver by the induction coil, which is a transformer. When these are combined, the standard circuit of Fig. 6-*A* is obtained.

The transmitter has a direct action as in a Type 1 mixer. In addition to this is the action of the induction coil. As the transmitter resistance rises and falls, an alternating current is shunted around through the condenser, receiver, and one winding of the induction coil. When the transmitter resistance rises, the IR drop or voltage across it rises. This increased potential difference acts on the shunt circuit, causing a flow through it in one direction. When the transmitter resistance falls below normal, the IR drop or voltage across it falls correspondingly. The condenser now gives up part of its charge, causing a reverse flow through the shunt circuit. This alternating current in the local circuit induces an alternating electromotive force in the main or line winding of the induction coil, which to a certain extent assists the direct action of the transmitter. Being somewhat out of phase with the direct action, the assistance is not complete.

The Dean common battery telephone with the bridge coil involves a principle in filters which is unusual. The principle of the Wheatstone bridge is used to keep direct current out of the receiver, while impedances force the alternating current through it. It follows Type 6, Fig. 4-*B*. Fig. 7-*A* shows the circuit of the telephone. The two coils, F and G, are inductive, being wound on iron. The coils B and H are non-inductive. The four coils are balanced as to ohmic resistance, so

that $\frac{F}{B}=\frac{H}{G}$. The receiver is placed in the position occupied by the galvanometer of an ordinary bridge, so that no direct current can pass through it. The path of the alternating current is through B, receiver, and H.

In practice the coils F and G are wound upon the same iron core, as shown in Fig. 7-B. These correspond to the direct current load of filter Type 6, but in fact perform no useful direct current function.

The circuit of the repeating coil or Hayes system involves a filter of Type 4, Fig. 4-A, and a mixer of Type 3, Fig. 2-C. The telephone, Fig. 8-A, is represented by a transmitter and receiver in series, which will be used to mean any type of common battery telephone. The line from telephone No. 1 is led through the supervisory relay and the windings A and B of the repeating coil to battery. When the transmitter is agitated, it causes the direct current to become undulating. This is treated as if it were a combination of alternating and direct currents. It passes through the repeating coil. The latter induces an electromotive force in the windings C and D in response to the alternating component, and thus filters out or repeats that element alone.

The windings C and D now mix the alternating current with the direct current which is flowing from the battery to telephone No. 2, and makes it undulating. This is a mixer of Type 3, Fig. 2-C. If the coils C and D be viewed as the generators of alternating electromotive force, then it may be called a mixer of Type 2, Fig. 2-B.

The necessity for automatic signaling caused the insertion

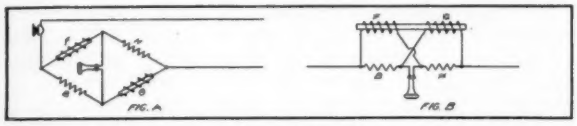


Fig. 7. Dean Circuit with Bridge Coil on One Iron Core.

of a supervisory relay in one side of the circuit. This relay possesses inductance, which tends to choke down the alternating current ripples in the direct current. To afford them free passage, a non-inductive coil is shunted around the relay. It is made high enough in resistance so that the relay will still get sufficient direct current to operate. This is to some extent a filter of Type 3, Fig. 3-B, though there is nothing in the non-inductive by-pass for the alternating current to do. It is an imperfect filter, for about 40 per cent. of the direct current fails to get into the relay at all.

The condenser-retardation coil method of working a common battery system transmits the voice current directly through condensers, while the direct current is fed into the line through impedance coils. In Fig. 8-B, C_1 and C_2 are two condensers connecting the lines of telephones Nos. 1 and 2. The transmission circuit consists of the two telephones, the line wires, and the two condensers. Around this circuit the alternating current flows. The battery furnishes direct current to each telephone separately. The four retardation coils, A, B, C, and D, prevent the alternating current from leaking across from one wire to the other. From the battery to each of the points, 1, 2, 3, and 4, the current is practically direct. From 1 through C_1 to 3 the current is strictly alternating. The same is true from 2 through C_2 to 4. From 1 through telephone No. 1 to point 2 the current is undulating, that is, a combination of alternating and direct currents. The same is true of the circuit through the other telephone.

For the purpose of speech transmission, it makes little practical difference whether the two coils are wound on the same iron core, as C and D, Fig. 8-B, or on separate cores as A and B.

This assembly of condensers and retardation coils embodies a filter of Type 1, Fig. 3-B, and a mixer of Type 4, Fig. 3-A. Considering alone the transmission from telephone No. 1 to telephone No. 2, Fig. 8-B, the retardation coils C and D could as well be omitted, as shown in Fig. 9-A. This shows it clearly to be a filter of Type 1, Fig. 3-B. The alternating current load is merely protected from direct current by a pair of condensers.

However, the receiving circuit requires direct current also.

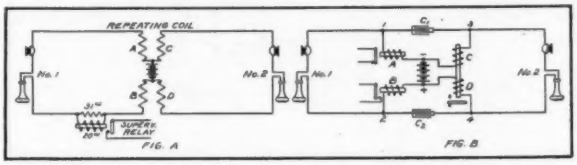


Fig. 8. Repeating Coil and Condenser-Retardation Coil Transmission Circuits.

This must be fed by a pair of retardation coils, C and D. The alternating current which was screened out by the condensers must be immediately recombined with direct current. Hence we may view this function of the system as a mixer of Type 4, Fig. 3-A.

The combination of a repeating coil and relay, as shown in Fig. 9-B, is sometimes used where a signal from a distant place is to be received without preventing speech transmission through the apparatus. The right half of the repeating coil has a relay inserted at its center. The relay is responsive to battery current from some distant point, and is made to operate such lamps or signals as may be desired. A condenser is shunted across the relay, so that the talking current may have a free path and not be cut down by the impedance of the relay. It is a filter of Types 4 and 5, Fig. 4-A.

An interesting case of separation of currents is afforded by the circuit shown in Fig. 10. The trunk line is one which may be used for ringing current, talking current, and battery current. When the distant office connects its circuit as shown, direct current flows over each side of the trunk as arrowed, thereby energizing the direct current relay and operating its associated signal. This current is kept out of the alternating current relay by condenser C_2, and cross flow prevented by condenser C_1.

When the distant office rings, the alternating current of low frequency (16 to 20 cycles per second) flows over the circuit and through the repeating coil. Though condenser C_1 allows part of it to pass directly, enough is shunted through the alternating current relay to operate it. This is an imperfect screen.

When the conversation is in progress, the high frequency alternating current, (200 to 1,500, or more, cycles per second), passes through condenser C_1, almost none of it flowing through the alternating and direct current relays. The inductance of the latter makes the screening more nearly perfect.

The transmission of alternating and direct current over one wire is also very well illustrated by the busy tone and fuse

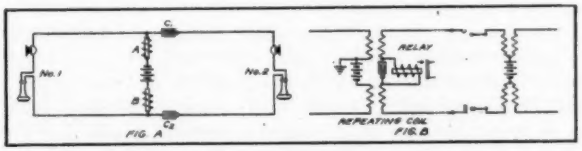


Fig. 9. Condenser-Retardation Coil System as Filter. Repeating Coil and Relay.

alarm circuit sometimes used between main and branch exchanges. Fig. 11 shows the essential features. The tone is produced at the main exchange by a coil and interrupter in the ordinary way. It is transmitted through condenser C_1, over the line, through condenser C_2, to the switchboard, where it is used to notify a subscriber that the called line is busy.

Negative battery is connected through the secondary of the tone coil at the main exchange, relay 1, line, to a contact on relay 2 in the branch exchange. A retardation coil connects the other spring of the relay to ground. Relay 2 is connected to the fuse alarm strip. When a fuse or heat coil blows, negative battery is thereby connected to the strip, so that

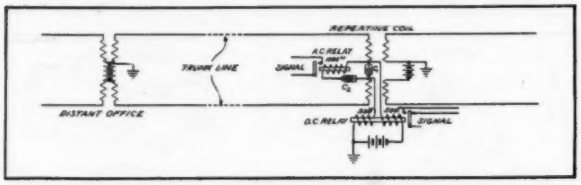


Fig. 10. The Three Current Filter.

relay 2 becomes energized. Pulling up, it closes the tell tale circuit as follows, positive battery or ground, retardation coil, contact of relay 2, line, winding of relay 1, secondary winding of the tone coil, to negative battery. This energizes relay 1, which lights the tell tale lamp, notifying the central office force of the blown fuse at the branch office. Condensers 1 and 2 keep the battery current where it belongs and allow the tone current to escape the impedance of relay 1. The retardation coil prevents loss of tone current during the time that the tell tale is in use.

Viewed from the standpoint of power work, the efficiency of these mixers and filters is often low. If there were sufficient need, the efficiency could be much improved. However, for present telephone work, they meet the need quite ac-

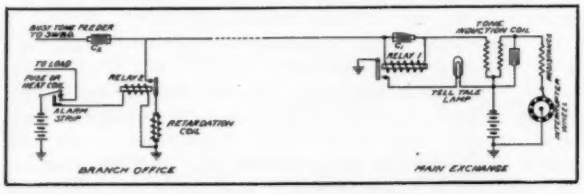


Fig. 11. Busy Tone and Fuse Alarm Over One Wire.

ceptably. In some cases they have very good efficiency. The condenser-retardation coil transmission set (Fig. 8-*B*) has been known to deliver to telephone No. 2 between 97 and 98 per cent. of the current which arrived at points 1 and 2.

Operators' School to be Held at Decatur, Ill.

The Central Illinois Independent Telephone Association will hold an operators' school in the building of the Decatur Home Telephone Co., Decatur, Ill., on September 2, 3, 4 and 5. W. S. Vivian of Grand Rapids, Mich., will conduct the school, holding two sessions each day, morning and afternoon. There will also be instructive and interesting talks by Miss Anne Barnes, chief operator of Bloomington Kinlock Co. and others.

The Central Illinois Independent Telephone Association is accomplishing some things which are of very much benefit and of interest to the telephone companies of Central Illinois as well as to the entire state. The association is incorporated and holds regular meetings every quarter. The next regular meeting will be held at the Chamber of Commerce rooms in Decatur on October 16 at which time the annual election of officers will take place.

This association was instrumental, through its attorney, Ben B. Boynton of Springfield, in securing favorable recognition before the legislature in the matter of the utility bill recently passed.

It is earnestly hoped that all companies in Central Illinois will send their operators for at least one day to this school. The expenses of the school are paid by the association but each company is expected to send their operators at its own expense. The committee who have this in charge are F. A. Bowdle, Posey Drew, and D. Van Curen.

Women Ask Telephone Probe in Des Moines.

Declaring that the Iowa Telephone Co. is furnishing Des Moines, Iowa, with inadequate and inferior service, suffragists of the city represented in the Political Equality Club, the oldest suffrage organization in the city, will ask the city council to exert itself to remedy the present conditions.

At a meeting these women, among whom are professional women who must depend largely upon telephone service to conduct their business, adopted a formal resolution of protest against the present telephone service. This resolution will be filed with the city council at once. The fault of the service, they contend, is not with the operators but with its mechanical equipment and lack of supervision by outside management. The suffrage women make no complaint against the women operators who, they say, are over-worked and forced to serve more than one switchboard, causing delay in telephone connection.

The request to the city council for immediate steps to improve the telephone service, carries with it a recommendation for a careful investigation of the length of working hours for women employes and scale of wages. In their interest in the welfare of women, the suffrage club members ask that the city council aid them in bettering the conditions of the women employes.

New Committee Chairmen of the A. I. E. E.

The first meeting of the A. I. E. E. directors for the new administrative year, beginning August 1, was held in New York on August 8, 1913.

President Mailloux announced the appointment of most of the Institute committees for the present administrative year. The chairmen of the standing committees thus far appointed are as follows:

Finance, J. Franklin Stevens, Philadelphia, Pa.; library, Samuel Sheldon, Brooklyn, N. Y.; meetings and papers, W. S. Rugg, New York; editing, Lewis T. Robinson, Schenectady, N. Y.; board of examiners, Maurice Coster, New York; sections, Paul M. Lincoln, Pittsburgh, Pa.; standards, A. E. Kennelly, Harvard University; code, Farley Osgood, Newark, N. J.; law, Charles A. Terry, New York; patent, Ralph D. Mershon, New York; educational, Henry H. Norris, Cornell University; electric power, David B. Rushmore, Schenectady, N. Y.; telegraphy and telephony, F. F. Fowle, New York; electrochemical, Albert F. Ganz, Stevens Institute of Technology; electrophysics, J. B. Whithead, Johns Hopkins University; use of electricity in mines, Wilfred Sykes, Pittsburgh, Pa.; use of electricity in marine work, C. S. McDowell, Lieut. U. S. Navy, Brooklyn, N. Y.; public policy, Calvert Townley, New York; historical museum, T. C. Martin, New York; U. S. national committee of International Electrotechnical Commission, Francis B. Crocker, New York; code of principles of professional conduct, George F. Sever, New York; relations of consulting engineers, Lewis B. Stillwell, New York; membership, A. M. Schoen, Atlanta, Ga.; constitutional revision, Bancroft Gherardi, New York.

New Use for Army Bayonets.

Army bayonets now form part of the emergency telephone outfit of forest rangers, used chiefly in fighting fires. This emergency line consists of small instruments and coil of fine copper wire. The wire is attached to the nearest telephone line, the bayonet is thrust into moist ground at the other end, and with the circuit thus completed the ranger can talk with headquarters, report his position and summon fire fighters if necessary.

All Work and No Play

An August Outing—The Telephone Picnic—Other Reflections

By J. C. Kelsey

"All work and no play make Jack a dull boy."

In this generation, this little truism has been carried into commercial life. It does not matter whether Jack is president, general manager or office boy, he can not escape the penalty of being a dull boy, unless he gets some play.

Every employe should be given a vacation. It is a profitable thing for any employer to do.

We get suspicious of employes who do not wish to take a vacation. We are liable to think that they have been doing something wrong, or that they do not want their accounts checked up.

Many a promising young man has been caught short after being forced to take a vacation.

What a fool a fellow is to take things that do not belong to him, anyway!

You all know of the Cuyahoga Telephone Co. It is a Cleveland utility. It has been the storm center of the justly celebrated Morgan deal.

There has been talk of merger and elimination, of one company or the other, entirely. But the two Cleveland telephone companies go marching on.

It is gradually soaking into the capitalistic mind that two telephone companies, under certain conditions, can serve a community to distinct advantage.

I do not mean to say that the capitalistic mind is ever going to encourage the organization of an utterly new competing telephone company, where the old one is doing its very best to keep up with the public need. But where both companies have fought a magnificent battle, survived the ordeal and are making money, then the capitalistic mind knows it will be financial suicide to destroy either of the properties.

We have all heard a great deal of "bunk" about the "confusion, waste and extravagance" of two telephone systems, but I have never seen it. The "confusion, waste and extravagance" comes from New York sources always, and then it appears exclusively in subsidized places.

Have you ever noticed any "nerve-racking ferment and hysteria" caused by the spirit of the Sherman act? I have looked hard for it—but not a sign! All I could see is activity everywhere.

No one has any time to become nerve-racked or hysterical over anything but slow deliveries.

So I honestly believe that in some localities two telephone systems will always exist, and will always be welcome.

Two telephone companies in a busy community inflict no burden and make no confusion. Almost every commercial institution needs two or more telephones to carry on its business.

What is the difference if the second trunk goes to another switchboard? Who really cares what denomination carries the message, just so it is carried efficiently and promptly?

Every bit of agitation against the second telephone is based upon the greed of the company in possession. Almost every hobby or prevailing idea is based upon some personal greed.

The mistake the Independents made was in failing to originate the cry for one telephone—they let the Bell company beat them to it.

I have run across many humorous sides to the beauty of one telephone.

When the North Dakota Independent was seeking a Fargo franchise, we heard a great deal about the evil of dual service. And the story of the beauty of one telephone was a wonderful fabrication. It was really artistic! And how effectively their beautiful story was used when the Bell interests asked for a franchise in Valley City to compete with the local company

It all goes to prove that all things are not what they seem to be.

It would be one of the greatest economic crimes of the age to wipe out such an organization as the Cuyahoga Telephone Co. Besides, there is the temperament of Cleveland, its susceptibility to municipal ownership, and its courage to tackle heart-breaking problems.

This organization found a property in a shaking condition, with poor credit, involved in many financial tangles, and with the prospect of failure not altogether dim and distant.

Today the company is a great success. It is making money. It reveals more truths concerning telephone economics than any company in existence.

From the president and general manager, down the line, stopping for Downey, the whole idea is effective work, efficient, economical and good.

Speaking of Downey, he is a crack lineman. He won the pole climbing contest at the annual Cuyahoga picnic. Incidentally he is a baseball pitcher.

He came from West Virginia in company with five other men, and they call themselves the "fighting six."

The fighting six were strike breakers. Only one man in Cleveland ever undertook to throw a brick at this crowd. When he came out of the hospital he entirely discouraged the habit of throwing bricks from housetops!

The fighting spirit is what counts, and it makes dollars for employers, too. No concern with a mollycoddle bunch of employes ever got very far.

But talking about fighting spirit, I was induced to umpire the annual baseball game between the construction crew and the office force.

The construction crew's baseball team contained the "fighting six," and the feeling between the forces was by no means playful.

In a foolish moment, I undertook to steer this troublesome vessel between Scylla and Charybdis. It was anybody's game clear up to the ninth inning. Every decision was likely to cause a riot!

I stood behind the fighting pitcher, Downey, and on each side of me were the "fighting six" basemen—truly a danger spot for a conscientious umpire. Three straight decisions were made against the "fighting six."

Pitcher Downey said mean things to me and threatened to bounce the ball off my head. He even intimated that I should clean my spectacles, and worst of all, insinuated that

I had never seen a ball game! It surely looked like a storm.

At once the value of organization showed itself. A word from the superintendent and the dove of peace returned to the picnic grounds.

Anyway, the construction boys won the game. But do not get the idea that there was any undue roughness.

The grand stand was full of ladies, and at no time was the spirit of the occasion violated.

The races were run, and one young man broke a collar bone while leading the sack race. He certainly had a fine system, but true to life, he could not keep up with it.

One young lady won three prizes. She ran the swiftest; threw the ball the farthest; and then won the cracker-eating and whistling contest.

The pole climbing contest was wonderful! And the hand line contest was won by the superintendent—all out of practice too—who calmly threw the hand line over a 45-foot wire!

And there was a voting contest, with votes selling at one cent each. The winner had 35,000 votes—the losers had a great many, too. The receipts went to the operators' benefit fund.

There are 365 days in the year, and occasionally 366. The Cuyahoga Telephone Co. took one day off, less than one-third of 1 per cent. of the entire year. And it paid handsomely, more than can be estimated.

It pays for departments to meet one another in friendly contest, or to mingle with one another in a holiday spirit!

The world has grown sordid, yet the knowledge that an organization can grow stale, has also gained breadth.

Every organization gives vacations, but it gives them in such a way that the work never ceases.

Why would it not pay better to shut everything down for two weeks, and everybody take a rest? Some day, some institutions bolder than the rest are going to do this very thing—at a profit, too.

Those who are worrying about the telephone business should take a vacation, too. I can't see a bit of difference between the complaints of kickers now and those of ten years ago.

When in a frame of mind which admits of nothing but ruin, take a day off and have a picnic with your fellowmen.

I recently received a letter from a telephone man who could not see the light of day at all. Nowhere did the sun shine!

It seems that Bell factory salesmen had been telling him things, and he believed them—"the Independent telephone business had but three years more to live," etc.—that famous old chesnut!

Now a man exhausted enough to believe such "bunk," should close up his exchange and take everyone for a picnic.

When you get your boys and girls out to the picnic, take a lesson from their laughter and enjoyment. They are no more irresponsible than you, only you do not know it.

Positively, there is little wrong with the world. It is getting broader and better, and the shadow of its opportunities never grows less!

Ever since Adam, some one has been looking for the end of the world. Even in our generation, men have sold farms and properties and prepared to meet the day of judgment!

There is something in the human blood which keeps him worried about something. In early pioneer days it probably was Indians. Today, it may be an investment in a telephone company. And he is looking for judgment day, when the Bell interests shall gobble him!

It must tickle the vanity of the Bell people to be considered such gobblers when they know their weaknesses so well!

Mr. Manager, take your investors, directors, "fighting sixes," operators and all to a picnic and make it an annual event. You will have a new viewpoint.

I am glad I went 400 miles to a picnic. I learned something. I got some new viewpoints.

As I looked at the picnic crowd—hundreds of people, men with their families, grown up in Cuyahoga service—I thought of the alleged cry for one telephone, and wondered whether any group of men would be foolish enough to abandon this time-tried concern.

I have heard that it is hard for small fry to understand the ways of big business. But I have had active enough contact with big business men to know that they are fallible and can make mistakes.

A great mistake will be made should any attempt be made to shift the identity of the Cuyahoga Telephone Co.

One thing I like particularly about the Cleveland matter—the utter frankness of the situation. They lay no claims to being the real Simon-pure Independents, as do so many institutions which we know are but masquerading.

They know that this precious (?) hall-mark has been removed, but every man and woman of them knows that it is a real telephone company. They buy as they please and are extending their service daily.

I believe masqueraders are of the most contemptible type.

I received a letter from an Iowa company stating that they had bought a Bell factory board on account of conditions which any one would know as a lie. The letter had a big Independent shield at the top, Simon-pure Independent, of course!

But everyone knows that the company is a plain masquerade, belonging to the Iowa Telephone Co. They have a perfect right to operate as Independent, but its officers should know that the open telephone field is laughing at them.

Very few telephone companies can conceal their real characters very long. There are too many people talking too much.

It always gives me pleasure to look back over the record of some now rabid (since his company sold out!) Bell man. True to life, he was just as rabid an Independent, one of those kind who would not even speak to a Bell man. His resolutions were always presented and, of course, red-hot against the Octopus.

It must afford the regular Bell employes a great deal of sport to listen to the shoutings of a recruit!

It is not very dignified to hold a grudge against these converts. On a recent sale, a company tried to make use of a so-called convert, one who was really discharged by the company he was seeking to damage, to help it convince the local telephone company not to buy a certain type of apparatus.

The turning of state's evidence of a discharged employe never wins much applause anyway, and its effect is always fruitless.

I am rambling all over the territory today. It is August, and it is rather difficult to stick to the subject.

We are glad that Kansas, Nebraska and Oklahoma have received the needed rain, however late it came.

I am sure the dry weather is neither the fault of the Bell nor President Wilson's administration.

Anyway, the picnic at Euclid Beach Park was a success!

MORAL: September really starts the new year.

Meeting of the Oklahoma Association.

The semi-annual meeting of the Oklahoma Telephone Association was held on August 12 at the Lee-Huckins Hotel, Oklahoma City. There was a good attendance and practically everyone present participated in the discussions of the various papers.

There was some discussion regarding the information asked for by the Oklahoma Corporation Commission in its order No. 132. It was finally decided that the information requested was essential and, at the request of the commission, a number of suggestions were made which, it is thought, will make the work more accurate and comprehensive.

In the morning routine business, such as reading the minutes of the last meeting, appointment of committees, reports and inspection of exhibits, occupied the time.

In the afternoon a number of papers were presented and discussed. They were:

"Long Distance Calls, How to Handle and Why," presented by M. M. Glauber, of Oklahoma; discussed by George Massey, of Watonga.

"Collections," presented by R. S. Robinson, of Stillwell. The discussion was participated in by Dick Wells, of Wetumka, E. A. Smith, of Norman, W. J. Steel, of Kingfisher, R. S. Goffe, of Sulphur, Horace Truman, of Geary, and B. A. Long, of Hinton.

"Co-operation and Reciprocity in Handling Collections," presented by E. H. Hendricks, of Hollis; W. W. Oder, of Cushing, C. Boarman, of Tecumseh, Mr. Renner, of Erick, and E. E. Westervelt, of Oklahoma City, took part in the discussion of the paper.

"What is the Public Entitled to?", presented by L. T. Hine, of Purcell, the following participating in the discussion: Ex-Senator W. P. Wynn, of Pocassett, D. D. Simpkins, of Minco, and I. H. Strickland.

"The Sales End of the Telephone Game," presented by J. A. Moad, of Hammon. The discussion was participated in by Senator Mooter, of Hanna, E. J. Boase, of Frederick, W. J. Murphy, of the Western Electric Co., J. C. Clark, of The Kellogg Switchboard & Supply Co., and A. A. Cronk, of Hobart.

"Depreciation," presented by Geo. P. Player, of Oklahoma City; discussed by L. H. Spencer, of Billings, J. F. Noble and J. J. Hayes, both of Oklahoma City.

"Commissions," presented by Attorney Nowlin, of Oklahoma City; W. H. Neal, of Ara; C. E. Devin, of Apache, and Frank McGuire, of Broken Arrow, took part in the discussion.

Telephone Users' Association Active in Chicago.

The Telephone Users' Association of Chicago, the organization of which was reported in the issue of August 2, has opened offices at 29 La Salle St., Chicago. It is planned to make this a permanent organization. The purposes and plans of the new association are given in a booklet entitled, "Better Telephone Service for Chicago." The objects as outlined in the booklet are as follows:

To give telephone subscribers a voice in the negotiation with reference to the sale of the automatic telephone system to the Bell company, and to do all things possible to safeguard the subscribers' interests.

To gather reliable information and furnish unbiased opinion by bulletins and through the press with reference to all matters affecting interests of the telephone subscribers of Chicago and suburbs.

To place telephone subscribers in a position where they may deal with the many and complex problems that must come up from time to time in the future and be correctly settled before Chicago and its suburbs will have proper telephone service.

To co-operate with all other forces and agencies of our civic life, including the telephone companies, city bureaus and commissions, in solving the problems relating to telephone service.

To furnish subscribers, at reasonable cost, expert traffic service and to recommend ways to reduce telephone costs and increase the efficiency of their service.

The pamphlet discusses in detail many of the points which should be of pertinent interest to all telephone users in Chicago.

A general publicity campaign is being conducted by Harold D. Stroud for the purpose of arousing interest in association and enlisting members. It is proposed to organize in much the same manner as political organization, that is, by wards and precincts. The slogan of the association is "Better Telephone Service for Chicago and Suburbs."

Earnings of Keystone Telephone Co.

A comparative statement of earnings of the Keystone Telephone Co. (combined companies) of Philadelphia, for the month ended July 31, shows a gain over the corresponding month of the previous year. The statement, which also includes a comparison of the seven months ending July 31 this year with the same months of last year, is as follows:

	For Month Ended		For Seven Months Ended	
	July 31, 1913	Year Previous	July 31, 1913	Year Previous
Gross earnings	$105,668	$101,460	$731,839	$698,651
Operating expenses and Taxes	54,582	52,070	371,281	350,766
Net earnings	51,086	49,390	360,558	347,885
Less interest charges	25,767	25,323	177,264	175,565
Net surplus	25,319	24,067	183,294	172,320

Louisville Mayor Refuses Compromise.

Mayor Head of Louisville, Ky., has notified the Cumberland Telephone & Telegraph Co. that the city will not accept the compromise proposition submitted by the company with a view of ending the long ending telephone litigation. This evidently means that the legal battle will be resumed as soon as the case comes up again in the federal court.

Employes of Tri-State Company Hold Picnic.

The annual outing of the employes of the Tri-State Telephone & Telephone Co., of the St. Paul and Minneapolis, Minn, offices, was held recently at Lake Minnetonka. All mention of telephones was barred on that occasion, the penalty being a ducking in the lake. Immediately upon the arrival at the park several mechanically inclined men rigged up a ducking stool and explained that the first person who "talked shop" was to be ducked.

Then the festivities began and continued all day without interruption, the ducking stool not being used once. The St. Paul employes carried off the honors in two baseball games. Among the other pastimes were races, contests and dancing in the pavilion.

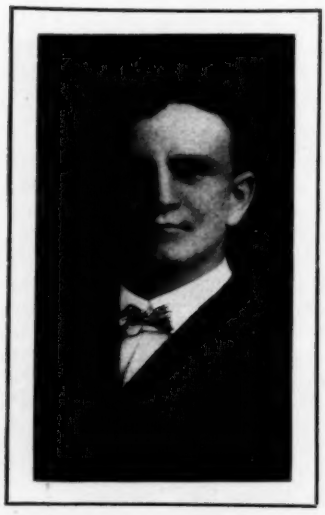
Nebraska Commission Allows Rate Increase.

The Nebraska Railway Commission has granted the application of the Nebraska Telephone Co. for a raise of rates at Lexington. The rates will go into effect September 1. Business telephones are raised from $2 to $2.50 per month and residence telephones from $1.25 to $1.50 with $1.25 for the two-party service.

A Quartet of Men Prominent in the Telephone Field

H. W. LUCIA, engineer of sales of the General Railway Signal Co., Rochester, N. Y., was born at Lexington, Mich., in February, 1879, and was educated in the public schools at Grand Rapids, Mich. He entered the service of the Stromberg-Carlson Telephone Mfg. Co. in 1898, at the age of 19, and remained with company for approximately 13 years. Several years of this time were spent in the installation department, after which he was placed in charge of the inspection department of the company. During the last two years of his service with this company, up to July, 1911, he served as assistant chief engineer. In July, 1911, he accepted a position as sales engineer of the National Police Signal Co., of Buffalo, N. Y., and continued with that company until October, 1912. In November, 1912, he became sales engineer for the Cracraft, Leich Electric Co. and continued in that position until May, 1913, at which time he was made engineer of sales for the General Railway Signal Co. and has since been engaged in selling the well known telephone selector of that company.

F. E. DRYSDALE, manager of the Commercial Telephone & Telegraph Co., Robinson, Ill., was born at Francisco, Ind., in February, 1879, and attended the common and high schools, after which he completed courses in telephony with the American and International correspondence schools. He began telephone service in 1901 as lineman for the Vermilion County Telephone Co., of Danville, Ill. He was with the Princeton Telephone Co. of Princeton, Ind., in 1902 and for a portion of 1903 and worked with the Cumberland (Bell) company as lineman and troubleman in southern Indiana and northern Kentucky during the remainder of 1903 and 1904. In December, 1904, he accepted a place as troubleman with the Sullivan Telephone Co., of Sullivan, Ind., and later became wire chief. In May, 1909, he became wire chief for the Commercial Telephone & Telegraph Co. of Robinson, Ill., and in April, 1913, was made manager. Mr. Drysdale has just completed the publication of a book entitled "The Telephone Man's Practical Trouble Finder and Hand Book."



ROE R. HOBBS, superintendent of telegraph of the Louisville & Nashville Railroad Co., at Louisville, Ky., was born at Louisville, Ky., in July, 1872, and was educated in the grammar and high schools, later taking a course in a business college. He entered telegraph service with the Western Union Telegraph Co. about 1890, and served as operator for that company and later for the Postal Telegraph Co. and for the Associated Press. He then entered railroad service as operator and subsequently became station agent. He was then made dispatcher and later chief clerk to the superintendent of transportation and chief clerk to the general manager. Mr. Hobbs is thoroughly familiar with telegraph and telephone work, having served in every capacity in the telegraph and telephone service of the railroad. His most important work has been that of equiping the Louisville & Nashville Railroad with a complete telephone system. He was appointed superintendent of telegraph in September, 1912. Mr. Hobbs is a member of the Association of Railway Telegraph Superintendents. He is a Mason.

CHARLES A. ROLFE, president and general manager of the Southwestern Home Telephone Co., Redlands, Calif., was born in Onondaga county, New York, in January, 1854, and was educated in the Utica schools, later receiving certificate of proficiency from the board of regents of the University of New York state. In 1877 he was elected secretary of the Utica Fire Alarm Telegraph Co., and was active in the manufacture, and sale of telephone switchboards and apparatus, establishing exchanges in numerous American and foreign cities. He was for some time connected with the Gamewell Fire Alarm Telegraph Co., in New York, and from 1877 to 1898 was secretary of the Police Telephone & Signal Co., of Chicago. Mr. Rolfe is the patentee of numerous practical inventions in telephony and has built and established several manufacturing plants. He purchased in 1905 an interest in the Southwestern Home Telephone Co., Redlands, Calif., bought out the Bell interests in the territory and merged the two. Mr. Rolfe is an Elk, a member of the Telephone Pioneers of America and various clubs.

Proceedings Before Commissions, Courts and Councils

Discussions and Rulings of State Bodies Having Supervision of Telephone Companies, Decisions of Courts in Matters Affecting Public Relations of Utilities, and Actions of City Councils Bearing Upon Franchises, Rates and Service

Unlimited Call Contracts in Pittsburgh to be Cancelled.

In order to conform with the new public utilities law of Pennsylvania which specifies that all public service corporations must charge like rates to all patrons, the Central District Telephone Co. (Bell), of Pittsburgh, has announced that all unlimited call contracts will be void after November 1. Many of the larger corporations of Pittsburgh and Allegheny county have unlimited service and, as the telephone company officials have decided that it would bring about a loss to make other similar contracts, these older contracts will not be honored after the date mentioned.

Because of the new ruling, several of the large manufacturing plants will find it necessary to install private lines, it is said, and so operate their own telephone system. The big iron and steel manufacturing plants cover acres of ground and heretofore the local telephone system has been utilized to connect outlying departments, but with the increase in cost which a limited service will cause, officials of the various companies are said to be considering the installation of private lines.

Tax Valuations Increased in South Dakota.

The South Dakota tax commission is closing up figures on telephone assessments and it is said that there will be an immense increase in the total figures over last year. The three big companies operating in the state, the Dakota Central, the Nebraska Bell and the Northwestern have been increased from practically a half million dollars last year to over two million this year, the Dakota Central going over a million dollars. The assessments of these companies are:

Dakota Central, 1913, $1,352,668; 1912, $357,045.

Nebraska Bell, 1913, $389,432; 1912 $88,094.

Northwestern, 1913, $331,438; 1912, $104,553.

The heavy increase in the Nebraska company is in part in the new lines, which that company acquired west of the Missouri river in the past year.

Commission Fixes Rates for Mitchell, S. D.

While the South Dakota Railroad Commission in no way makes any settlement of the litigation pending at Mitchell between the city and the Dakota Central Telephone Co. over recent difficulties, they make absolute rates which that company may charge in Mitchell as follows:

	Per Month
Main line, business rates	$3.25
Main line, residence rates	2.25
Calling and talking extension	1.00
Talking extension	.50
Each main line trunk	3.00
Each station connected to private branch exchange	.50

The Dakota Central company, though ordered out of the city of Mitchell by the city itself, made application to the railroad commissioners for rates. The commissioners in making the rate schedule, order former rates of that company out of existence, and the company is ordered to keep separate accounts on separate vouchers for operating expenses and maintenance of plant at Mitchell, in addition to its system already prescribed by the Interstate Commerce Commission.

The railroad commissioners claim no right to in any way settle the litigation concerning the telephone troubles at Mitchell as existing between the Dakota Central Co., and Mitchell, which is now in the higher courts.

They also take the position that they have the right under the law to fix rates, on local plants, as well as long distance. The city officials declined to appear at the time set for a hearing on the rates, but presented an affidavit denying the right of the railroad commission to fix rates on any but toll lines in the state.

The commission sent a representative to Mitchell to inventory the property of the company. The company claimed a valuation of $119,802.74 but the commission announces the valuation at $105,240.92. The rates as announced will allow the company a little less than 7 per cent. earnings on its investment, according to the commission. The new rates according to the commission went into effect August 1. Meanwhile the city, it is reported, is taking steps for the erection of the municipal telephone plant as authorized by the recent special election.

Orders Night Service Without Rate Increase.

The South Dakota Railroad Commission has ordered a night telephone service to be put in at Plankinton, S. D. It has refused permission to increase rates, a dollar a month on each telephone for that service, the showing of the company being deemed sufficient to give the people of that town the night service without the increase.

Oklahoma Court Declares Constitution Provision Valid.

The validity of the provisions of the Oklahoma constitution, which require telephone companies to make physical connections with other lines is likely to be tested in the Supreme Court of the United States as the result of a recent holding of the Oklahoma Supreme Court upholding finally those provisions. The matter has been in the Oklahoma courts for more than four years and all of the resources and influence of the Bell telephone company have been thrown into the fight because of the effect which such a holding would have on its business, not only in Oklahoma, but in other states.

The test was made on an order of the Oklahoma Corporation Commission requiring the Pioneer Telephone & Telegraph Co. (Bell) to make physical connection with the exchange of the Grant County Telephone Co., at Pond Creek, Okla. The litigation was begun in 1909 when the Grant county company made application to the Oklahoma Corporation Commission for such an order.

The Pioneer company made its first fight before the commission, which went into the matter exhaustively, taking voluminous testimony and holding hearings on all of the points involved in the controversy. At the conclusion of the hearings, the commission issued the order, proceeding under section 5, article 9, of the constitution, which gives it authority to take such action "should any telephone company establish a system of toll lines throughout the state, the exclusive use of which, in its own exchanges or such other exchanges as it may select, would have the effect of giving it a complete monopoly of the telephone business in the state."

It was stated in the commission's order that the evidence disclosed that the only local exchange in Pond Creek had been purchased by the Pioneer and the local rates increased. The people of the town, becoming dissatisfied with this condition, organized a company and installed a small exchange.

The Pioneer then followed with a reduction of rates which in some cases were put as low as 50 cents per month.

In the meantime the Pioneer company had fortified itself in a business way by the installation of long distance facilities and had put in a modern plant throughout. While the testimony presented before the commission does not show that in detail, it is claimed that the Pioneer spent about $15,000 on its local exchange and long distance facilities in Pond Creek, which was a rural county seat town, while the Grant county company's holdings represented an investment of about $3,800.

The Pioneer company at once appealed to the state supreme court. Before the commission the issue was primarily whether a state of facts existed which would give the commission jurisdiction under the constitutional provision. Before the supreme court it was still asserted that the facts were not sufficient to justify such action and the validity of the constitutional provision itself was also attacked.

The Oklahoma Supreme Court has so far been very slow to overturn any provisions of the constitution as three of its members were members of the constitutional convention which drafted that document, while Justice Williams was chairman of the committee on public service corporations and had particular charge of the formation of the corporation provisions of the constitution, including the section attacked in this case. The court on the first hearing of the case affirmed the commission, but it was admitted that there might still be a question in regard to some of the points involved and a rehearing was granted in order to allow the attorneys for the Pioneer to present further legal authorities. Following the rehearing the commission's order was again affirmed, which closes the matter finally so far as the Oklahoma courts are concerned.

If the case goes on up to the United State Supreme Court, as now seems probable, it is understood that it will be on the ground of confiscation of property. Under the order as it now stands, the company owning long distance facilities, installed by it at considerable expense, would be compelled to furnish connections for long distance calls to another local exchange operated in competition with its own. It is claimed that in such cases local pride would in many instances cause subscribers to patronize the Home company, inasmuch as they knew that they could get the long distance connections anyway, and this would make the business unprofitable for the company which had the heavier investment.

In many respects the situation covered by this case parallels that created by the natural gas pipe line law, passed by the last legislature, which is now under fire in both federal and state courts. That law made the pipe lines common carriers and required them to purchase or carry through their pipe lines a certain amount of the product of all wells in a field which they tap, even though the pipe line company might own wells of its own, which furnished sufficient gas to supply all demands made upon it.

Rates Reduced Pending Action by Commission.

Officials of the Michigan State Telephone Co agreed at a meeting with the state railroad commission to charge only $15 a month for private telephones and $18 for business telephones in Olivet, Mich. Last June the company raised the rate to $18 and $24, and all of the citizens ordered the telephones out, stating that discrimination was shown, as Bellevue subscribers were charged the lower rate. The telephone company will charge Olivet subscribers the lower rate until the railroad commission has a chance to investigate the matter further.

Oklahoma Case, Filed With Interstate Commission, Settled.

The Oklahoma Corporation Commission has dismissed the complaint filed by it with the Interstate Commerce Commission against the Pioneer Telephone & Telegraph Co. on behalf of the Arnett Telephone Co., in which the question of an alleged telephone monopoly in the state was raised.

The Pioneer company has agreed to all of the things asked by the Arnett company, principal among which were the establishment of physical connections and interchange of service and the case will therefore not be pushed before the Interstate tribunal.

Commission Rules Against Reduced Rates to Municipalities.

No more will the state of Michigan or any county or municipality within its borders, receive a reduced rate on telephones. In an opinion handed down by the Michigan Railroad Commission, it is pointed out that it is discrimination for a telephone company to give a lower rate to the state, county, or municipality than is given a private subscriber. As a result, state, county, and city telephone rentals probably will be increased.

At the present time the state is paying $20 a year each for its telephones, while business houses and private subscribers pay much more. An act passed by the legislature of 1911 prevents such discrimination and it is more than likely that when the contracts are renewed for the next year, there will be an increase in the rental.

Protests Increase in Telephone Rates.

On behalf of the O'Neill Commercial Club, of O'Neill, Neb., S. J. Weekes, as vice-president, has addressed a letter to the Nebraska Railway Commission protesting against the proposed rates for business telephones, from $2 to $2.50, and for residence telephones from $1.25 to $1.50 per month, and requesting a hearing at O'Neill to give the commission a correct view of the matter. Among other things the letter says:

Your understanding is based on a misapprehension of the facts, in so far as O'Neill is concerned, at least. The Holt County Telephone Co., which was recently purchased by the Nebraska Telephone Co., was organized by the writer in 1901. The telephone exchange at O'Neill has always furnished full metallic service and operated under rates as above stated for the last 12 years. That the rates charged by the local company were amply high, is proven by the fact that the company never paid less than a 20 per cent. annual dividend, while the writer was associated with the company—from 1901 to 1907. Furthermore the local company, during most of the period, paid the Nebraska Telephone Co. $2.50 per annum on each telephone used.

The O'Neill telephone directory, issued in July, 1913, by the Nebraska Telephone Co., shows it has 162 residence and 90 business telephones in operation within the city limits. The proposed increase in rates on these 252 telephones alone, not taking into consideration the increase on rural lines, extension sets and other increases, would amount to $2,026 per year. The proposed increase in rates would be exorbitant. The present rates would be reduced rather than increased. On behalf of the Commercial Club of O'Neill, we respectfully, but earnestly protest against any increase in telephone rates in O'Neill.

Telephone War in Long Beach, Calif.

A bittter fight has been going on in Long Beach, Calif., between the telephone company and the city council. Complaints seeking the arrest of President Geo. B. Ellis and Superintendent Percy G. Copeland of the Home Telephone Co. were issued, the charge against them being that they were demanding a higher rate for telephone service than the city had fixed.

This will bring matters to a climax and the fight against the higher rate will be straightened out in court.

Ohio Company Petitions for Interchange of Service.

The Brownsville Farmers' Telephone Co. has petitioned the Ohio Public Utilities Commission to compel the Newark Telephone Co. to interchange service. The matter is under advisement.

The Rejuvenation of the Craneville Telephone Exchange

A Story in Serial Form, Telling How a Rundown Telephone Plant Was Rebuilt, Enlarged, and Changed Successively from a Grounded to a Local Battery Metallic System and Later to Common Battery—Second Installment

By Paul Hamilton

"My name is Barrows, Mr. Rankin," said the visitor, offering his hand.

"Glad to meet you, Mr. Barrows. Going to be a devilish hot day, I take it," responded Mr. Rankin.

"We've been having some along that line down at Barnesville," said Mr. Barrows.

"Barnesville nestles in the hills if I recollect the Banner right," commented Mr. Rankin, "but I reckon some folks down that way wished she didn't 'nestle' quite so much these hot days. We are not troubled that way. There's most generally a breeze here on one side of the street or the other."

"It wasn't on account of the heat that I came away from Barnesville. I've heard that you desired to dispose of your telephone plant and found it convenient to come down this morning to investigate the rumor."

"Before I say yes or no, I'm going to ask who you represent," replied Rankin, "if you don't object to telling," he added.

"I have no objection whatever to answering such a question. I represent myself, John T. Barrows, solely and absolutely. Any investment I decide to make will be with my own means entirely. I understand you are the nominal owner of the Craneville Telephone Exchange?"

"Yes, sir, Mr. Barrows, I am. Every stick and stone of her belongs to P. J. Rankin. As to whether I want to sell or not, I'll say I do, in a way. Now, then, we understand each other so far."

"That depends upon what 'in a way' implies?"

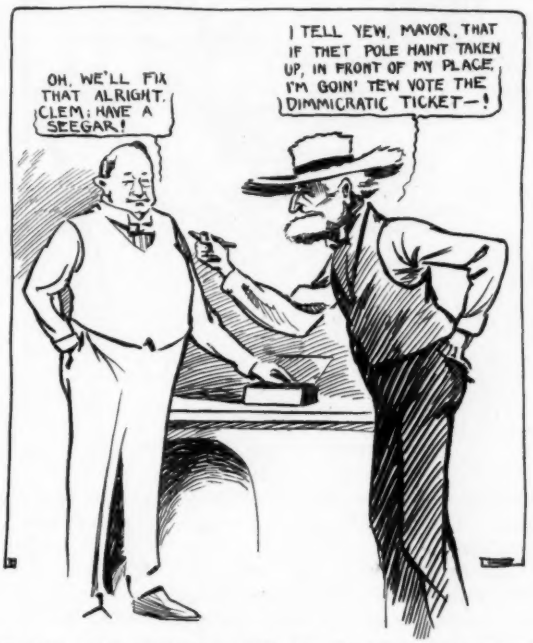
"Now, maybe we'd better strike that from the records. I'll sell if I can get what I think the plant's worth. Let's put it that way, just the same as I'd sell a horse or a town lot," said Mr. Rankin.

"Starting from there perhaps we can work out an agreement. I've been in the telephone game since I was a boy. I've thought many times if I ever got together money enough to start into business for myself, I'd try some other line. But when it came to making a choice, it didn't seem reasonable to cast aside 20 years of experience and study, and go into something which I would have to learn from the bottom."

"I guess you're about right. Here's my case. I went into this thing with the idea that it would be easier money and less risk than livery and real estate. I bought out a fellow named Tuttle, who came here from somewhere and built the plant. I intended to give up livery and real estate, but, just as you say, I feel kinda sure in them lines, having been in them all my life, so I've changed my mind about giving them up. I haven't time for all of them. With the new-fangled telephones coming along every day, 'twould take a Philadelphia lawyer to keep track of them. So if I can get out of the boat with dry feet, I guess I'll turn the oars over to someone else and go ashore."

"I understand you, I think. I probably would feel the same way if I were to go into the livery business. Now let's get down to the starting point. Every public utility must have a substantial legal basis upon which to do business, the same as a buggy should have a good set of axles, otherwise it may find itself stranded by the roadside some fine morning."

"I see, I see," returned Mr. Rankin. "You mean a franchise. I guess that's one thing I have that is of top value. It covers everything a person could ask for, overhead and underground, the use of all streets and alleys. There ain't but one flaw in it that I know of, and that is the location


OH, WE'LL FIX THAT ALRIGHT, CLEM; HAVE A SEEGAR!
I TELL YEW, MAYOR, THAT IF THET POLE HAINT TAKEN UP, IN FRONT OF MY PLACE I'M GOIN' TEW VOTE THE DIMMICRATIC TICKET—!

"It Isn't a Case of Money," said Mr. Rankin. "It's Politics."

of poles is left up to the street committee. They can come and say, move such and such a pole north or south, or east or west, and make a heap of trouble about it, if they want to."

For the first time, Mr. Barrows smiled. The smile did not escape Mr. Rankin.

"No! No! It isn't a case of money. It's politics. Happens most generally 'round election time. Some doubtful voter generally wants the pole moved from in front of his property. Of course the commission gets busy. But I haven't had much trouble since I got to the root of it. I just send Big Frank around to explain things to the property owner. Big Frank is my right hand in the telephone business—the left, too, for that matter."

"What is the term of the franchise?"

"It was for 25 years and has run seven. There's a ten-year renewal clause, with compensation or something of the kind. I'll get you a copy. There are some around the office somewhere. Now, about the plant."

"Now, Mr. Rankin, perhaps I've taken enough of your time this morning. We can't very well go over things accurately without consulting records and perhaps we'd better arrange a definite time for that. If you have no objection, I'd prefer to look things over without any definite information in mind, and form a general opinion of my own."

"I was going to suggest something along that line. As I said, Big Frank is my mainstay. He'll be around pretty soon and any information you want, he'll give to you. I'll tell him to give it to you straight, so there won't be any 'come backs' if we make a deal."

"Very well, that will be agreeable to me. I'll drop in after dinner."

"Wait a minute, here comes Frank now. Here, Frank," Rankin called, "shake hands with Mr. Barrows. Mr. Barrows is going to put in a little time looking over the exchange. I've told him you'd give him any information he wants."

"Here, Frank," Called Out Mr. Rankin.

"Glad to meet you," said the visitor.

"Same to you, sir," responded Frank.

"I'll probably see you this afternoon, and in the meantime I'll find some way of entertaining myself," were the prospective buyer's parting words.

"What's on this morning, Frank?" asked the proprietor.

"I'm going up the east road and see if I can patch up that line. There are a couple of telephones to take out up there also."

"All right. Be around about eleven. I want to talk with you."

"I'll be back by then, I guess," and Frank went out through the exchange.

The result of his trip and his return as far as the livery barn has already been recorded in this history. At a few minutes past eleven, he was again in the presence of his employer.

"Well, Frank, I think I've got more than a nibble this time; it feels to me like a good healthy bite."

Frank made no reply to this greeting.

"I told Mr. Man," Rankin continued," "to depend on you for any information he might want, beyond what he can see. Now if the deal goes through your house will stand on record clear and unencumbered. There's still a hundred and twenty due on it, I believe."

"Mr. Rankin," said Frank, "my house, or rather the mortgage on it—does not convey to you any lien upon me. I ——"

"Wait a minute Frank, wait a minute. Don't fly off the handle. I guess I did jumble that a little. Now, it's like this. I want you to give Mr. Barrows all the information he asks for. Make it the exact truth so far as you know. He's been in the business all his life and as far as general conditions go, I guess he can see for himself. Don't put any flourishes on. If he buys, it will be to your interest. I can easily convince him that you are in no ways responsible for the condition of things. In fact if I'd have followed your advice perhaps I could get more out of the plant, now I have the chance. But I've had the cream, and haven't lost any money. The real value of the plant is the franchise and that's what I'm going to sell him. The rest of it goes in for good measure. Is that clear to you?"

"Yes, sir, that's different. I'll do as you say, but I don't expect any extra pay for it," Frank replied.

"I know you don't, but I guess you've earned it. Anyway I was going to allow you a little extra pay and the mortgage will about even it, if that will ease your mind any."

"Now I'm going to tell you another thing. This fellow, or the fellow who invented telephones, can't make this exchange pay during the life of the franchise. Your job won't last very long in my opinion and when the fall comes your house will be clear. Maybe it will be six months and maybe a year, but take my advice and get ready for a rainy day. I ain't wishing the fellow bad luck, mind you. Far from that, but I can't see any way out of the hole."

"I don't agree with you as you well know. The people want telephones or rather telephone service. They'll pay for it and there's nothing in the franchise to prevent charging a rate that will return a profit on the investment," replied Frank.

"Ho-ho-ho. I'd like to see someone spring a raise of rates on this town," laughed Rankin.

"Perhaps it won't be necessary, but it can be done, provided the service is rendered. They are paying more now than their service is worth."

"I don't know but you're right there. But how about those who don't pay?"

"Well," answered Frank, "give them something for their money and most of them would pay without any trouble."

"Maybe, maybe, but any way I'm willing to give up the game. This Mr. Man knows a little what he's up against. Kitty was having her regular morning tirade when he came in. If he's a telephone man, he knows what to expect. If he isn't, it don't much matter. Even I know Kitty's no person to have at the board, but I was too late finding it out."

"The mayor's line is on the bum," called Kitty from the switchboard.

"There, Frank, that's that copper metallic circuit. What *can* be the matter with that?" chided Rankin, who had permitted the installation of a copper circuit for the mayor upon Frank's advice.

"I 'spose Kitty has knocked that brace out from behind the board and the drops are all out of plumb. It seems almost impossible to keep that board level," Frank replied.

(To be continued.)

Lightning Lifts Nail From Floor.

Lifting a wire nail from the floor and driving to the head into a board in the ceiling eight feet above is one of the freak stunts of a bolt of lightning, reported from the Davis Log Hotel at Brighton, Utah, near Salt Lake City, according to an item in the Journal of Electricity, Power and Gas.

The lightning is said to have struck a disconnected telephone wire leading from a pole in the road to the side of the hotel, following the wire through a small hole in a log, splitting off a chunk several feet long, descending to the floor of the kitchen and ripping a hole in the board. A wire nail on the floor is claimed to have been elevated from the floor and driven to the head in the ceiling, the ceiling being punctured by small bullet-like holes in a score of places, and a mattress on a bed directly above the kitchen set afire.

The Motor Truck Considered as an Efficiency Tool

Cheaper Than the Horse Considering All Factors Involved, Such as Cost of Feeding, Housing and Other Items—More Sanitary in Cities—The Efficiency and Economies of the Motor Truck—Its Rapid Adoption in Every Business

By Rollin W. Hutchinson, Jr.

The economic considerations that enter into the substitution of motor truck for horse transportation in practically every line of commercial enterprise goes deeper than probably most people would think. That the removal of horses from city streets tends to cleanliness, to sanitation, and to the more efficient handling of congested traffic; that motor trucks by their greater speed and endurance, broaden their owner's selling territory beyond what can be reached by horse service; that motor operation is more economical than horse operation, all these things are recognized, in a general way by business men. That there may be a connection between the high cost of living and the high cost of maintaining horse transportation equipment is not so obvious to the casual observer, though there is ample ground for connecting the two things.

The evidence in this connection lies in the increased cost of living, so to speak, for horses as for human beings. It has grown simultaneously and in nearly exact proportion, for animals and for men. Accurate calculations from the actual market reports show that in the last five years, the cost of feeding a horse has increased 137 per cent.

Inasmuch as a horse's feed is produced by the soil on which the food for human beings, whether grain, vegetable or flesh must be raised, and even with its enormous acreage of unused land, the United States imports each year more and more of the things that are grown in the soil, it is plain that to reduce the cost of living for men, women and children, one of the easiest and most evident steps is to devote to producing food for them however much may be necessary of the acreage now used for raising rood for draught animals.

Motor Truck Cheaper Than Horse.

This sounds theoretical and fantastic at first, perhaps, but the hard test of plain figures shows it to be practical and common sense. There is not a point at which the motor truck is not cheaper to maintain than the horse. For example:

To give the most working efficiency, a horse must be stabled near his work. Not only is the time it takes to drive him from the stable to the "job" just so much lost out of the working profit-units, but every step of the way is taken from the distance he can travel in his day's work. A horse, being flesh and blood, has limited endurance. A machine, if properly built, and suited to the work, has practically no limitations.

The necessity of stabling horses near their work to save both time and strength going to the "job" and returning from it, means a constantly increasing expenditure for housing. For in cities, and even towns, stables frequently must be located in districts of fast-raising property values. The motor truck, on the other hand, suffering no weariness of the flesh, and having from twice to six times or even more, the speed of the horse, can be housed at any distance from its working base that may be desirable for economy. Furthermore, the garage is not the unsanitary nuisance that the horse stable is; and as a single motor truck, properly used, will do the work of from three to six two-horse teams, it is fair to calculate that the motor truck equipment required for a given amount of work will occupy no more than one-fifth the floor space required for horse equipment. This allows for the space occupied by wagons, horses, feed and so on.

Lack of Disinterested Advice.

Such difference in the cost of maintenance is appreciated by most men who have given their transportation service serious thought. But there are other elements in load moving costs which are not so obvious until you begin to dig down. The fact that many a master of transportation began as a stable boy, became a driver, and has been promoted to his job at the head of delivery and trucking service because of his knowledge of horses and how to get the most out of them, puts a good many business men at a disadvantage in solving transportation problems, because their advice is not disinterested.

Neither, for that matter, is the advice of a maker of motor trucks disinterested, in a sense. But every successful business manager knows that part of his success is due to the fact that he has pushed the sale of his commodity, whether it is manufactured product or some kind of service, in the direction in which he knew it would absolutely make good. A motor truck concern which has proper regard for its future and its commercial standing will not advise the substitution of motor trucks for horses unless there is a certainty of their proving profitable, either by making a saving or by extending business, or in both ways.

One of the most interesting of modern commercial advisory agencies is the traffic and engineering department of the motor truck companies which have real records of the performance of different types of machines extending over a considerable period of years. It is the experience of the engineers of this organization that the master of horse transportation when he figures the expense of his department frequently overlooks or omits such items as veterinary expense, and loss of a horse's time by reason of sickness, which involves having spare animals that cannot be used economically.

For instance, one large concern which motorized its transportion after a searching investigation, discovered to its surprise that its wagon service was costing $2,000 a year more than it had been reckoning on in the mere matter of veterinary advice, to say nothing of treatment or the cost of having an animal's work done for him while sick.

Comparative Time for Work.

Horses that are used carefully will not work more than 50 per cent. of the working days of the year. It is possible to get 75 per cent. of the working days out of a horse, but this is done at the expense of his endurance; he wears out more quickly. On the other hand, a good motor truck is in prime condition 90 per cent. of the time, taking out all the time lost on repairs and adjustments. And in 90 per cent. of the year's working days, the motor truck will work practically 24 hours a day if necessary; that is to say, it has no moods, it is never "half sick" and so to be coddled; when it is in commission, it is up to full efficiency the whole time.

One of the minor economies of motor trucks that is

frequently pointed out is that they do not eat when they are loafing. That means that fuel expense stops every time the truck stops in a well constructed car. There is no Sunday feeding, no holiday feeding; no Sunday or holiday exercising or cleaning, or other care. And while one man can look after horses, a competent mechanician, who may be a good mechanic instructed by a motor truck engineer, can give motor trucks the necessary supervision.

There is another important consideration in the difference between motor trucks and horses as investments. A horse grows old every day, whether he works or not. He is wearing out with age all the time, even if he spends most of his hours in a stall. The motor truck wears only when it is in use; when it is idle there is no expense connected with it whatever, except the interest on the investment. And a horse accumulates interest on money invested in him in the same way.

Few concerns would re-equip themselves with horse transportation now. A horse that has been used in delivery or hauling service, especially on city pavements, is of little value for any other use when he is too far gone to be valuable for that. An old wagon or horse dray is absolute junk. It costs more to patch up and renew superannuated horse equipment than it does to entirely re-equip with motor trucks that will do the same amount of work.

Early Mistakes.

The use of motor trucks is still a recent thing. In the very early days, mistakes were made by both the builders and owners, and some of the wrong impressions which took root then have grown and spread since. For instance, to get the most value out of a motor truck by both saving money on present delivery costs and extending the selling area of a business, it is necessary, of course, to lay out the transportation system anew, making it fit the changed conditions. One truck will do the work of a horse and wagon a good deal better than the horse and wagon will do it, but it would be wastefully, because, like every other machine, a motor truck must be kept in constant motion during working hours to earn the full profit of which it is capable. Unless a business uses at least three horse wagons, it cannot use one motor truck to advantage.

The amount of money involved in motorizing a business has sometimes caused hesitation, even when the management of the business was convinced of the value of motor trucks in a general way. Yet a study of actual experience shows that a good truck not only pays for itself surprisingly soon, but earns enough more in a short time to pay for the horse equipment it has displaced, and after that it is a steady dividend producer.

Practical and economic reasons are working together for the rapid motorizing of every business which uses transportation. The economic reasons will, naturally, be the last to be recognized; but the every-day, practical reasons are in themselves sufficiently obvious to carry on the evolution with steadily increasing rapidity. The experimental stage of the motor truck is passed. There are makes of trucks which have been in use so long and under such a variety of conditions that their performance is a fixed factor, which may be counted on absolutely. The wise business man with his skill in applying efficiency tests, and his measuring costs against profits, is enabled to apply to his particular concern the technical and engineering knowledge which the expert automobile engineer will provide for him.

Rural Lines in Saskatchewan.

As recently stated, government ownership of telephones in Saskatchewan is confined to the main lines and the urban exchanges, the rural lines being run on a somewhat different plan, as it was thought it would not pay the government to build and operate rural systems. Instead, a number of farmers may band together and have a service of their own, linked at some convenient point with the main government system.

The group of farmers must be not fewer than twenty nor more than thirty in number. They apply for a charter of incorporation and the Provincial Department of Telephones supervises the organization, provides the poles, and sends an inspector to see that the system is properly constructed, built to the required standard, with not more than ten subscribers on one line. A board of directors is appointed, and some responsible person, usually the president or the secretary, is appointed to manage the company, considerable liberty being given in its management to the company.

Since July, 1908, when the idea was first put into operation, 243 rural companies have been organized, and 5,700 pole miles of line erected, there being 6,027 subscribers. Extension work is constantly going on, and now companies are being formed annually. The system is found to work well. The local companies soon acquire skill in operating their telephones, and are able to make repairs, etc., at a cost far below what would be involved were it necessary for the Provincial Telephone Department to send a man specially for the purpose. The department sends an expert only when the difficulty is beyond the skill of local or amateur mechanicians.

During the first year after the government went into the telephone business, i. e., up to the end of May, 1909, 31 rural companies were organized; at the same time a beginning was made with long-distance lines. In May, 1909, the Bell system was purchased by the government for $368,924, an admittedly advantageous bargain; in July the Saskatchewan Telephone Co.'s plant was acquired for $150,586; and in October a small system run by the Wapella-Harris company was secured, this bringing all the telephones in the province into the government's hands.

By the end of 1909 all these systems were standardized, and working smoothly together. Forty-five additional rural companies were incorporated during that year, bringing the number of subscribers up to 2,118. At the same time, acting under the municipal telephone act, a number of villages established municipal systems, but it was deemed inadvisable to continue to allow villages to run local systems in view of possible conflict with rural systems, so the general plan of having the department run all town and village systems was approved, and this is practically the situation at the present time.

The provincial system comprises considerably more than 70 telephone exchanges, with nearly 200 toll offices, well over 2,000 pole miles of long distance, and nearly 8,000 wire miles. The number of subscribers in towns and cities amounts now to about 12,000, besides some 7,000 or 8,000 subscribers to the rural systems. From the financial point of view, conditions are quite satisfactory, a profit on operations being realized each year.

Automatic telephones were found in Saskatoon, one of the principal cities, where they were early introduced, but elsewhere in the province they have not yet been introduced to any great extent.

Requested Not to Gossip Over Telephones During Harvest.

In a series of letters between the officers of the telephone company at Beloit, Kan., and its subscribers, the patrons of the company were asked to stop social conversations over the telephone during the harvest season so that the farmers could have free use of the lines in soliciting the assistance of farm hands to help gather the crops. The farmers in the vicinity were paying farm hands $3 to $3.50 per day and every minute lost by short help was money out of the farmers' pockets.

Practical Subjects—Letters and Discussions

Letters from a Retired Lineman to His Nephew.

Podunk Valley Farm.

Dear Ben:

I see you think some of my suggestions were worth passing along. I noticed one of them in my last copy of TELEPHONY. Of course I didn't write them with the idea in mind of publication, but it is all right so far as I am concerned. The editor is the man who is responsible for the makeup of his magazine.

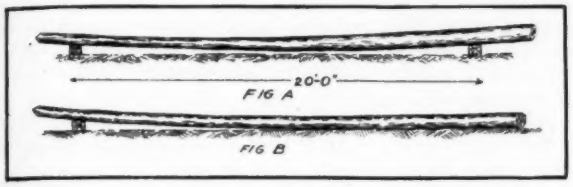


Fig. 1. Improper Method of Placing Skids Under Poles.

I never have had much ambition to become a literary light—only once that I remember did I undertake writing for publication. One of the village boys named Bob was the originator of the idea that he, Dan Smith, and myself should write a few dozen dime novels and earn money enough to carry us through fair week without having to carry water for the race horses.

We were all enthusiastic enough at the start. In dividing up the work I was assigned the task of making the cover picture. I drew it after my own idea, as soon as the name was decided upon. Bob invented the name. It was "Iron-Tooth, the Eye Gouger." Some name, what?

Bob was to write the first chapter, Dan the second, and I the third. Bob and Dan wrote their chapters without collaboration and of course they didn't hitch together very well. They didn't like my picture, so the work was never completed and we carried water to the horses as usual.

I went up the line the other day to replace a pole shattered by lightning. I was told where I would find two poles

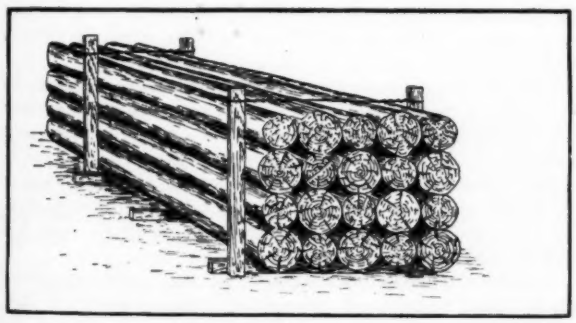


Fig. 2. A Good Method for Piling Poles for Storage.

stored, not over a mile from where I wanted one. I found the place all right, but the poles were well rotted and past their day of usefulness. They had been on the ground so long that the lower side of each was completely rotted away. I don't suppose this is the only case where good timber has gone to waste through carelessness.

The care of poles is a problem worth considering. Their value at the present time warrants some expense for their preservation until used.

Their depreciation from exposure does not justify keeping them shedded. This statement does not concede that a proper place is alongside of a barn or shed, where the drippings from the eaves will fall upon them.

First of all skids, of suitable dimensions, should be laid, to support the poles entirely clear of the ground. The skids should be placed not more than ten feet apart. If skids are placed at the ends, or near the ends only, the poles will warp with a result something like this (Fig. 1-*A*). The result is worse with a skid under one end only (Fig. *B*), as half the pole will eventually touch the ground. A pole with a natural crook should be laid bow side up. In that position, it will straighten to some extent.

The ground under the pole and for two or three feet around should be kept clear of vegetation. If weeds, grass, and vines are allowed to grow up through the spaces between poles, they hasten the process of decay. Also, the risk from fire is increased.

A permanent way of preventing the growth of weeds is to cover the ground a couple of inches deep with ashes, cinders, or gravel. The latter precaution need be taken only when the poles are to be left for an indefinite period.

Before piling, each pole should be carefully inspected. Defects, such as knots, scars, bruises, holes, or weather cracks which will afford refuge for insects, such as ants, etc., should be poured full of creosote, or mineral paint. In addition to

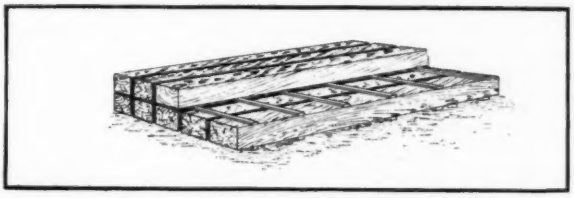


Fig. 3. Piling Cross Arms When Exposed to the Weather.

preventing the action of insects, it preserves the pole against decay at such defective spots.

In laying the poles, weather cracks and holes should be placed downward, if possible, to prevent water from getting into them.

It is poor policy to store poles on railroad rights of way. I recall one instance where a railroad company confiscated half a carload for storage, having complied with all legal requirements to locate the owner. Stenciling the company's name on one or two of the poles would have overcome the point of unknown ownership.

In another case which I remember, a crooked station agent sold ten fine poles and pocketed the money. A farmer paid him $20 for the lot and cut the poles into fence posts. The only satisfaction we got was a look of chagrin when we informed the old fellow that the poles were worth at least $75.

When our old foreman, Barker, cleaned up our last job, we left the extra poles well cared for by "racking" them something like this (Fig. 2). Poles piled in this manner with the stakes bound with No. 6 iron wire are apt to stay put, while if piled promiscuously, they are liable to stray, one at a time.

Cross arms should be cared for in much the same manner. However, they can more readily be put under cover. If so, they should be piled compactly so as to prevent warping.

If exposed to the weather, allowance should be made for free circulation of air through the pile. Narrow separators, or binding strips, should be placed between each layer. Lath is suitable for this purpose, and should be laid crosswise the pile, not more than 18 inches apart. The arms should not touch each other and a space should be left between them like

this (Fig. 3). No. 6 iron wire may be used for binders or separators, running a continuous wire across and back from the bottom layer to the top.

Buddy just broke a window in a neighbor's house and he's come to collect from me. I've told him not to be frightened over little things like that. Boys will have accidents and to punish them only makes them deceive you the next time. I think it teaches them manliness and self-reliance to give them the money and let them go and settle the account for themselves.

Your Uncle Dick.

"He Didn't Have It With Him."

This article is intended for troublemen and managers of rural exchanges but perhaps it will be of help to those higher up in the telephone business also. "He didn't have it with him," often happens to be the case with the rural troubleman. Most rural exchanges have grounded lines, as we have, with perhaps from 4 to 15 telephones on a line. The writer has been troubleman for one company for seven years. Readers will agree with me that it is best not to buy different makes of telephones, as it requires considerable extra material for repairs. We do not think it necessary for a troubleman to carry a telephone instrument with him as it is not easy to take care of and in the next place if a new instrument is installed, the subscriber is apt to tell his neighbor and he will want a new one right away.

Take just enough parts to care for practically any kind of trouble. First of all will be mentioned a grip or box to carry the parts in. In my case I made a box of ½-inch hardwood about 3½-inches deep inside, by about 16-inches wide by 18-inches long with partitions enough to keep the supplies from becoming jammed together when carried over rough roads. This box is lined with mohair plush, which we got from the upholsterer. Good hinges were used and a hook placed on the lid. The corners were bound with scraps of galvanized stove pipe iron. The lid of the box was covered with black oilcloth to keep out the rain.

An inventory of what should be in this troubleman's box would include a small tray on the inside of the lid for holding cords and small stuff; a few mouthpieces; two ear pieces for receivers; a couple of transmitter fronts; two or three receiver shells and one complete receiver; one ringer movement less gongs; some receiver and transmitter cords; an induction coil; carbons and micas for arresters; about 20 inches of bare copper wire; some insulating tape; a few spikes, staples, tacks and insulated tacks to fasten wire to house; a few screws for attaching porcelain insulators to buildings and screws to fasten telephones to walls, and plenty of solder and paste or flux. I would add right here—solder everything that needs soldering. Don't forget this and learn how to make a good soldered joint.

Take a blow torch in addition to the regular tools such as spurs, stretchers, safety belt, splicing clamps, etc. We carry a small coil of outside wire in case of a breakdown and a coil of copper wire for grounds. As to grounds, we make a ground wire or rod out of copper wire, by simply twisting together two or three strands of the copper. After determining the length wanted, churn a hole in ground with a rod and water, pull the rod out and insert the wire. Have the rod made by a blacksmith and not less than six feet long.

We think this copper ground is superior to any other ground, as it is easy to solder to. It can be bent around porch sills and made to fit, and is no more costly than a galvanized rod. We think it has also as good conduction. The copper wire we use is about the same size as No. 10 iron. So much for the ground wire.

A few insulators, brackets and pins should also be included in the wagon. I forgot to mention a screw driver, but I carry two sizes. If I forgot anything, take that, too. Right here I will mention a few "don'ts."

Don't forget anything.

Don't forget to make note of a broken pole in your little book.

Don't drive by a slack wire, or pin without an insulator, expecting to come back that way. You may never come back. "Do it now."

Don't argue with a subscriber about the nature of a trouble. He is trying to tell you about it and you can gather from his description of it, what it is.

Don't try to fix a telephone until you know just what is wrong, and then be thorough with your work.

Don't rush into a carpeted house with your cowhide boots all covered with mud.

Don't forget to take batteries with you.

Don't feed batteries to a defective transmitter or induction coil. Leave the transmitter or coil repaired.

Don't miss your dinner at some good natured subscriber's, for those dinners you get in the country are fine.

Don't write me and say that I forgot the most essential thing for a troubleman to have with him. Be sure you have it and don't forget it. Use the above, mixed with a willingness to work and earn your salary, and we think you can repair the average amount of telephone trouble.

If you have not been out in a locality lately, just stop in and see if all the telephones on that line are in good condition. It does not take long and may save you another trip.

Vail, Iowa. W. M. B.

Value of the Motorcycle in Trouble Work.

The efficiency of a telephone company's service depends, in a large measure, says an Exchange, upon the efficiency of its trouble or service department.

Everything may run smoothly for a week or two weeks; with few complaints of any kind, when a wind or electrical storm may demoralize the entire system. Then it is up to the trouble department to get out and repair the damage that has been done; and to do it quickly, if the telephone company is to establish or retain its reputation for real service.

And it is exactly in this department that hundreds of telephone companies all over the country have found the motorcycle very useful. With motorcycles their repair men can go quickly from one end of town to the other, or, in the suburban and country district, cover miles in minutes where it used to take hours.

Then, too, the motorcycle enables the telephone company to have service men on the job all the time, making the rounds and testing lines so that trouble may be averted or corrected at once. C. E. Rosebrook, for instance, has charge of three hundred telephones in and near Rushylvania, Ohio. To cover his route is a matter of 85 or 90 miles riding; and the motorcycle that he is now using has proved its ability to cover the ground in all kinds of weather.

Rosebrook purchased his machine last fall; and during the whole winter he was never stopped by snow or mud. Besides being reliable, his motorcycle has proved itself 100 per cent. more efficient, as it enables Rosebrook to cover twice as much territory as he formerly did with a horse and at about half the former expense.

Some Pertinent Advice For Subscribers.

The following maxims for the benefit of the subscribers are published by the Peoples Consolidated Telephone Co., of LeRaysville, Pa.:

If You Want Good Service.

Be patient—The operator may be crowded and lines busy.

Be polite—It pays. Vinegar catches no flies.

Be prompt and pointed. There are others waiting.

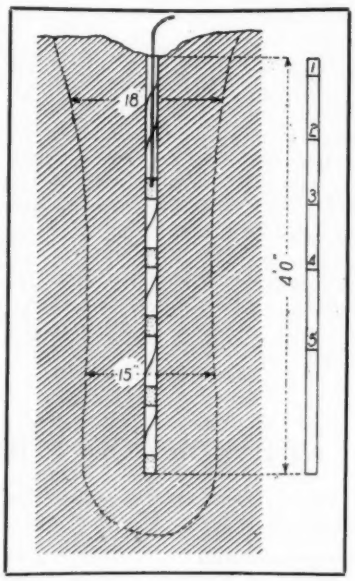
The Blasting Method of Excavating Holes for Telephone Poles

Results of Experiments to Develop Practical Method of Using Dynamite in Digging Holes—The Tests Made and Dynamite Used, with the Description of Methods Employed in Placing It—Comparison of Cost Over Hand Digging

An investigation and report on the use of dynamite in digging pole holes was recently made by Van Deventer & Warren for the Du Pont de Nemours Powder Co., of Wilmington, Del. As this subject is of interest to telephone men the report, which was published in the August issue of the Du Pont Magazine, is reproduced.

The objects of the investigation were to develop a practical method of using dynamite for digging pole holes; to ascertain the tools necessary; the cost as compared with hand digging; and the proper quantity and quality of explosive to employ.

The earth should be disturbed as little possible. The hole should be of even size from top to bottom, and just large enough to take the pole. The depth of hole ranges from 4 feet for 20-foot poles to 7 feet for the 50-foot size. The average hole is 4½-5 feet deep. The poles on telephone



Method of Spacing Charges of Dynamite.

lines are set 150 to 175 feet apart and the average is 35 to the mile. The average diameter of holes is 14 to 18 inches.

Often with hand digging, there is a tendency to make the holes shallow, owing to the difficulty of working at any depth—even with a post hole digger. This is particularly true in clay soils or in cases where the hole rapidly fills with water.

The usual methods of digging are so well known as to require no description, except to say that the class of labor usually employed is rapidly becoming more difficult to procure. Hole digging is laborious work; nearly every man wishes to become a lineman or do some other kind of work. It is difficult to keep a trained gang of diggers for any length of time.

Average costs of usual methods of digging are difficult to secure, owing to the difference in labor in various sections of the country and the character of the various soils encountered. Many telephone managers think holes can be dug, especially on country lines, for a few cents each, and forget the cost of supervision, lost time, etc.

From a large number of records of various companies in all sections of the United States, the following is found to be a conservative estimate of the average digging: Cost for 25-foot poles as commonly used for farm lines is 58 cents each; other sizes will cost in proportion.

EXPERIMENTS WITH DU PONT DYNAMITE: All holes hereinafter mentioned were wanted 4½ ft. deep. Soils were "Clay and Water," and "Hard Clay," the latter being such that a digging bar would be necessary. The holes were made with an earth auger.

Hole No. 1.—Half stick of Red Cross Extra 40 per cent. in bottom of hole, untamped. Results: Poor; large cavity blown in bottom of hole, about 30 ins. diameter; earth for 2½ ft. below surface undisturbed.

Hole No. 2.—Half stick of Du Pont 60 per cent. in bottom of hole, half stick Red Cross 40 per cent. 2 ft. from top. Cap in top stick, untamped. Results: Good; hole not sufficiently opened up at top, and earth falls in, filling up.

Hole No. 3.—One-third stick Du Pont Straight 60 per cent. at bottom, one-third Du Pont Straight 60 per cent. 8 ins. from bottom, half stick Red Cross 40 per cent. 20 ins. below surface. Cap in top stick, untamped. Results: Good: hole clean and open.

Hole No. 4.—One-third stick Du Pont Straight 60 per cent. at bottom, same 12 ins. up. Same 12 ins. up, cap in top of stick, untamped. Results: Same as No. 3, except more earth thrown out of hole.

Hole No. 5.—One stick Red Cross 40 per cent. at bottom, hole filled with loose sand. Results: Good hole, but not opened enough on top.

Hole No. 6.—One stick Du Pont Straight 60 per cent. at bottom, hole filled with loose sand. Results: Broke soil in all directions; no hole.

Hole No. 7.—Five quarter sticks Du Pont Straight 60 per cent. evenly distributed about 6 inches apart, beginning at bottom hole, untamped, cap at top. Results: Good, hole uniform in size, top and bottom, and dirt blown out.

Hole No. 8.—Four quarter sticks Red Cross 40 per cent. distributed same at No. 7. Results: Good, same as No. 7; not quite so much dirt blown out of hole.

Hole No. 9.—Hole half inch in diameter full FFF blasting powder. Results: N. G.

Hole No. 10.—One stick Red Cross 20 per cent. at bottom, untamped. Results; Blew pocket; top of hole not open.

Hole No. 11.—One stick Red Cross 40 per cent. Results: Same as No. 10.

Hole No. 12.—One and a quarter sticks Du Pont Straight 40 per cent. in small pieces in paper tube. Pieces about 4 ins. apart, beginning at bottom to within 14 ins. of surface. Results: Excellent hole, clear of dirt.

The holes having the dynamite distributed along the bore gave the best results. Dynamite only at the bottom does not open the hole at the surface. Too heavy a charge disturbs the earth too much, especially at the bottom of the hole. Holes Nos. 3, 4, 7, 8, and 12 were the best of the series.

Considerable difficulty was experienced in determining the proper tool to use in making the hole for the dynamite. The ordinary punch bar will not do, except in very light soils, as it is unhandy. The auger is a better tool, but too much time is lost in pulling it up to free it in clay. A four-foot punch bar that can be driven, was found to give excellent results, if knocked sidewise while driving, so as to enable it to be removed. A hollow crown drill with crossbar having a cutting head to remove 1¾ inches and then bore of 2¾ inches, gave the best results, enabling a hole 4½ feet deep to be made in about five minutes by one man.

As the dynamite must be distributed, considerable time can be saved by making up cartridges of paper, 4 ft. 6 ins. long. This is done by rolling stiff wrapping paper around a stick of the proper diameter and fastening the pieces of dynamite in it by sticking ordinary pins through the walls of the paper tube. This properly spaces the pieces of dynamite and leaves a free space between them, thereby insuring the firing of the lower pieces, the cap always being placed in the top piece. Without the paper tube, there is some danger of the lower piece not exploding, especially if much loose dirt intervenes. Water does not affect the proper exploding of the lower pieces, but loose soil does.

The paper tubes can be stiff enough to push into the hole without crushing. A convenient way of placing the pieces of dynamite, is to have a stick with marks 1, 2, 3, 4, etc., on it, and to push the pieces into the tube, one at a time with this stick, and pin them.

There is no necessity for using an electric exploder in connection with this work, but the use of safety matches is suggested. The fuse need only project two or three inches above the surface, and should be bent to one side. The operator may be within a few feet of the hole, when the dynamite fires, without danger, as there is no general upheaval of earth.

An ordinary post hole digger is desirable for removing the loose earth. No digging bars are necessary, the earth being well broken. The average time for cleaning the hole to receive the pole is five to ten minutes.

Taking the cost of a hole by hand digging at 50 cents, a fair average, Holes Nos. 7 and 8 would cost in cents:

	Hole No. 7.	Hole No. 8.
For dynamite	12 1/16	8½
Fuse and matches	1	1
For labor	14	14
For supervision	3	3
Total cost	30 1/16	26½

The total number of holes per day will be greatly increased when dynamite is used. The labor is much less, and the poles may be more firmly set, as the earth about the pole is packed by the explosion, thereby reducing the amount of tamping necessary when the pole is set. Thus indirectly a considerable saving is effected.

Fewer men are required when dynamite is used. The gang may be made up as follows: Wagon with tools and dynamite; two diggers; one man with flags and dynamite; one digger to trim up hole; one man with fuse and caps.

These are followed by the regular pole raising gang; or in some cases, after shooting a given stretch of holes, the same crew goes back and sets poles.

The long cartridges are perfectly made up before the work begins. If necessary, supplies of them may be distributed at various points. The usual precautions necessary when handling and transporting explosives should be employed. It is not advisable to cut sticks of dynamite at the holes as needed, as there is danger of leaving pieces about.

The diggers make the holes. Two holes behind the diggers, comes the "loader," who puts the cartridge in the hole and places a red flag on its top. One hole behind the "loader" comes the "shooter."

Every 10 holes, the loader may recover the 10 flags taken up by the shooter.

While it is possible for one man to load and shoot, this is not advisable. A rule should be that the four men comprising the gang should not get out of sight of each other. Such a gang will complete from 30 to 50 holes a day, say a mile of holes per day of 10 hours.

The dynamite method is not only easier than hand digging, but actually costs less. There is practically no danger. Greater progress can be made with the line, especially in hard soils. In the majority of cases, one stick of 40 per cent. will do the work.

As the average man is not familiar with handling explosives, clear instructions of a general nature, particularly as to cutting the sticks, putting in fuse, etc., should be given. Also diggers should be cautioned about not inhaling fumes in holes, etc.

Some Facts Concerning Telephone Transmission Problems

Discussion of Various Factors Which Influence the Transmission of Speech Over the Telephone—Difficulties Encountered by Railroads—Concluding Installment of Paper Presented at Annual Convention of Association of Railway Telegraph Superintendents

By Elam Miller and C. A. Robinson

Duplex Cable.

In bringing toll and long distance circuits into large cities, it is usually necessary to place the circuits in cable construction at the outskirts of the city and to bring them to the city office in cable, the length of cable involved in any particular case varying from a relatively short length up to 10 miles or more. In the past, where the open wire, long distance circuits were phantomed, it was often very difficult to bring the phantoms through the cable without introducing excessive noise and cross talk difficulties. Two or three years ago, however, as a result of a considerable amount of development work, the manufacture of so-called "duplex" cable was begun. As a result, phantom working in cables is now becoming very common, it being entirely feasible to work a relatively large number of circuits through the same cable over considerable lengths of toll entering cable without interference.

The advantages of duplex cable over the old form of non-duplex cable are obviously very great for toll entering purposes. It is now the standard practice with the telephone companies to place duplex cable in all new installations of this character. It should be noted, however, that while a very considerable amount of work of a research and experimental nature has been directed towards the development of successful duplex cable, it is not possible at present to manufacture commercial duplex cable, any considerable lengths of which can be guaranteed free from excessive unbalances without special balancing at the splices. In the present state of the art, the requisite high degree of balance cannot be obtained during manufacture. It is necessary that special precautions be observed during installation, so it may be said that a successful duplex cable in place is dependent quite as much upon proper installation as upon the methods used in manufacture. To secure, therefore, duplex cable in which cross talk it not excessive, the manufacturer should be required to guarantee the finished product in place.

While it was stated above that in all new installations of toll entering cable, cable of the duplex type should be used, there are, of course, a large number of existing toll

entering cables of the non-duplex type, through which it may be very desirable to carry phantom circuits. In some cases of this kind the question will doubtless arise as to whether phantoms should be brought in over the existing non-duplex cables, or whether the existing cables should be replaced by duplex cables. It is difficult to lay down any general rule for this use of existing non-duplex cable for phantoms. It does not seem, however, that any large expense should be incurred in replacing an existing cable to provide for phantom until it has been determined by test that the existing cable cannot be made to bring in the required number of phantoms without excessive cross-talk. In all such cases cross talk tests should be made to determine just how severe the cross talk is, especially between phantoms and their own sides and between the different phantom combinations.

The method usually followed in picking out combinations of pairs in non-duplex cable for phantom working is to abritrarily select two sets of pairs each, for bringing in two phantoms, and then to test these phantom combination against each other, and each phantom combination against the two pairs making up its own side circuits to determine if they are satsifactory. If either set is not satiasfactory, another set is chosen arbitrarily until two satisfactory sets are obtained. A third set is then chosen arbitrarily and tested for its own cross talk and against the other two phantoms. Progressing in this way, the entire number of phantom combinations which are required in the particular cable in question is obtained. Evidently, the difficulty of doing this increases very greatly with the number of phantoms required. In picking out suitable combinations of pairs for phantom working, also, the question of noise has to be considered. It may be that certain combinations which are satisfactory from a cross talk standpoint, would be too noisy and would have to be discarded on this account. If, in any case, it has been determined by test that a sufficient number of phantom combinations to bring in the open wire phantoms cannot be obtained in an existing non-duplex cable, it is then proper to consider the replacing of this cable by duplex cable.

Loading.

One of the potent factors in the development of the Bell telephone system, especially in the extension of the range of long distance telephony, has been the application of the principle of loading.* The question has been raised on a number of occasions as to why loading cannot in general be applied equally as well to the long open wire telephone circuits of various railroad companies to increase the range of transmission over them, or to permit the stringing of lighter circuits and loading them to obtain the desired transmission equivalent.

While very material benefits in the way of increased transmission efficiency and in cheapened line construction are possible by the proper application of loading under certain service conditions, it must be explained that loaded circuits possess characteristics which exclude their use in many parts of the Bell telephone plant today. It is necessary that the degree of balance on loaded circuits be very much greater than that on non-loaded in order that cross talk may not be excessive. The effect of leakage or low line insulation on loaded circuits is much more deleterious than on non-loaded circuits. Further, the design of the loading coil itself is such that currents beyond certain relatively low values, cause magnetization of the core, largely reducing the inductance and introducing irregularities, and the effect of lightning may cause similar difficulties.

The introduction of bridges on loaded circuits causes greater transmission losses than on non-loaded circuits and special care is required in connecting loaded circuits to each other and to non-loaded circuits to prevent transmission losses at the junction points. Because of these inherent characteristics loaded circuits are far less flexible than non-loaded circuits and their successful use is limited to conditions that permit of the observing of many necessary precautions.

In general, it would seem that conditions in railroad work are not such that all of the conditions necessary to insure successful operation with loaded circuits can be observed. Where but a limited number of circuits are on the same lead, it is frequently necessary that the circuits be used for both through and way business. If these circuits were loaded, the introduction of bridges would introduce in many instances losses so serious that the circuits might well be less efficient than if non-loaded. Even if in certain cases a circuit can be set aside for long haul through business exclusively, there are still important reasons from a physical standpoint why loading cannot in general be proved in on railroad telephone lines. In loading open wire circuits, it is the practice to space the loading coils as uniformly as practicable at 8-mile intervals on continuous stretches of open wire line. If, however, the lines are broken up by short stretches of cable, the spacing of the loading coils has to be correspondingly shortened up to allow for the higher electrostatic capacity of the cable conductors. While proper allowance can be made when the loading is originally laid out for any stretches of cable which then form part of the circuits, any changes later on, by which relatively short stretches of open wire are replaced by cable construction, will introduce irregularities in the uniformity of the loading, which may be very disastrous from a transmission standpoint.

On railroad rights of way, more or less reconstruction work of one kind or another is constantly in progress. This often necessitates removing the open wire pole line temporarily in the stretches where the reconstruction work is being done and replacing it with emergency cable. The emergency cable which is used has, of course, a much higher electrostatic capacity than the open wires which it replaces. As mentioned above, it would require only a few such conditions on a loaded circuit to render the transmission worse than if no loading had been done. The temporary construction work, moreover, is usually not up to the standard which is required for permanent construction, which means that while the temporary construction is in, the insulation and general maintenance conditions of the circuits will not be up to the high grade which is essential for loaded lines. All things considered, therefore, it is our feeling that except in rare instances the requirements and conditions of railroad telephone and telegraph service would exclude the use of loading.

All that has been attempted in this paper has been to give some facts, a knowledge of which, it is felt, may prove helpful in laying out a railroad telephone system from the telephone transmission viewpoint. One thought which it is particularly desired to have stand out above all others, is that no matter how well the initial design of the telephone system may be, satisfactory transmission conditions will not last unless the system is carefully supervised and maintained. In our telephone system we have found that supervision and maintenance are as essential to good service as the proper initial designing and constructing of the system itself.

(*Conclusion.*)

*Those who are interested in this subject are referred to a paper entitled "Commercial Loading of Telephone Circuits in the Bell System," by Mr. Bancroft Gherardi, presented at the 28th Annual Convention of the American Institute of Electrical Engineers, Chicago, Ill., June 28, 1911.

Railway Telephony—Practical Points in All Branches

A Regular Department Which Appears Semi-Monthly—Scope Includes Principles of Construction, Testing, Operation and Maintenance—Columns Open for Contributions on Matters of General Interest to Those Engaged in This Branch of Telephony

Railway Telephone Courtesies.

By John A. Kick.

A business telephone should be answered in an intelligent manner and not by "Hello." Note the difference between the two following methods of answering a business telephone.

IMPROPER METHOD.

Party called: "Hello."
Party calling: "Is this the A. & B. Co.?"
Party called: "Yes."
Party calling: "Can I speak to Mr. Smith?"
Party called: "This is Mr. Smith."

PROPER METHOD.

Party called: "The A. & B. C., Mr. Smith talking."

The latter method is short and to the point. It means business and is impressive in that sense.

A comparison between the proper and improper method of answering a residence telephone would be:

IMPROPER METHOD.

Party called: "Hello."
Party calling: "Who is this?"
Party called: "Who are you?"
Party calling: "Is this Mr. Smith?"
Party called: "No, this is Mr. Jones. Who are you?"
Party calling: "What is your number?"
Party called: "Black 2345."
Party calling: "I called Black 2245."

Both parties are angry and the calling party frantically twiddles the switchhook.

PROPER METHOD.

Party called: "Black 2345."
Party calling: "Wrong number, I beg your pardon."
or
Party called: "Black 2345."
Party calling: "May I speak to Mr. Smith?"

Improper methods of answering are no worse than those of improper calling, where the calling party demands "Who is this?" without any formalities of advising by what right, or courtesy, an answer is expected.

Railway long distance circuits are difficult to operate unless very careful supervision is exercised. Calls for a party may be made as a call for a department, with the result that the actual time a full conversation is wasted in finding that the party called is absent from the department. A call through a department may be handled in two ways.

IMPROPER METHOD.

Party called: "Yes" or "Hello."
Party calling: "Is this the engineering department?"
Party called: "Yes."
Party calling "Is Mr. Jones in?"
Party called: "Yes."
Party calling: "May I speak to him?"
Party called: "Yes, wait a minute," etc.

PROPER METHOD.

Party called: "Engineering department."
Party calling "This is Mr. Smith of Chicago. I would like to speak to Mr. Jones."
Party called: "One moment, please, I will call Mr. Jones."

Both parties are businesslike and trying to use common courtesy. It is very difficult to frame the exact wording to the satisfaction of every one, but in the main, intelligent brevity not to the exclusion of business courtesies, can be strongly counselled.

On dispatching and message circuits, the word "hello" has absolutely no meaning and should not be accepted as an intelligent expression. A way-station should answer by giving the station name, as "Chicago," and the dispatcher by his title "Dispatcher," not by the name of his station.

On message circuits, the way-station uses the station name in answering, as can the relay office operator. Thus a dispatcher and relay operator at the terminal have a means of identifying themselves on the circuit, or circuits. To ask the dispatcher a question the following shows the contrasts.

IMPROPER METHOD.

Way-station: "Dispatcher?"
Dispatcher: "Hello."
Way station: "How is 23?"
Dispatcher: "Who is this?"
Way station: "Chicago."
Dispatcher: "About 10 minutes late there."

PROPER METHOD.

Way-station: "Dispatcher—Chicago. How is 23 please?"
Dispatcher: "About 10 minutes late."

The latter method is effective as the dispatcher knows at once who is speaking and can answer intelligently and without delay.

It is rather embarassing to answer something like the following:

"Sheot-2-b-bout-fi-minutes-late" or "Ot 2 git there bout seven leven," only to find it was the general manager who asked, "Dispatcher, how is No. 23 running please, Chicago?"

To the credit of the dispatcher and way-station operator, it must be said that the old Morse method of dispatching required brevity, and courtesy was neglected by force of circumstances. Telephone methods give ample time to act like a regular human being and the old style of talking in the Phillips code is fast disappearing.

It is a fact that an old time operator can actually use a "near Phillips code" in verbal conversation. While he acquired the habit through a life time of "cutting it," he can now take a long breath of relief, fill his lungs, and talk "United States" without hearing someone say, "Send Morse."

As an example that courtesy pays, an actual case of failure of an operator to be courteous to his superior is given.

Mr. R. Jussell, formerly superintendent on the C. D. & E. R. R. and now general superintendent on the S. T. & U. at Portland, Oregon, is an excellent operator, and on many occasions would send his own telegrams from way-stations. On one occasion he was answered by the main office and in his fast gait started his telegram. The receiving operator, failing to recognize the superintendent's personal sign, took exception to the form of sending, by reason of no filing time being given.

Such remarks were sent by the operator as "Don't you know how to send a message, etc.," "Send the office call, your sign, filing time, etc." Mr. Jussel patiently complied with the requests, only to receive some parting compliment when the "wise one" gave his O. K.

A little later the operator casually asked "Who the Samhill is that guy R. J. at Sy?" To which he received the reply, "That's Mr. Jussell, the superintendent." For the next week that operator dreaded a summons to the "carpet" and during the next week he prayed for it so as to have the agony over.

Telephone courtesy pays, for one never knows "who the guy" may be at the other end of the line.

Denver & Rio Grande Installing Telephone Dispatching.

The Denver & Rio Grande Railroad is now installing telephone train dispatching between Ogden, Utah, and Grand Junction, Col., a distance of about 330 miles. Two No. 9 hard drawn bare copper wires form the circuit. It is expected that the first section of 114 miles, between Salt Lake City and Helper, will put in service about September 1, and the rest of the line some time in October or November.

Railroads Operated by Telephone.

At a meeting of the salesmen of the Western Electric Co., held recently in Chicago, G. K. Heyer, of New York, stated that there are approximately 285,000 miles of railroads in the United States and Canada. Train movements from 1851 to 1908 were governed by telegraph and the first telephone despatching was tried in October, 1907. Today there are some 70,000 miles operated by telephone. Many large roads are now nearly fully equipped, among them being the Lackawanna, New York Central Lines, Lehigh Valley and Atchison.

Forty per cent. more work can be done by train despatchers with the telephone. Some roads report a saving on an average of an hour and a half in running time on all freight trains. This amounts to about $14,000 a year for each 150-mile section.

Trains are being equipped with portable telephones so that the train crews can talk with the despatchers and iron box telephones at the sidings speed up the freight and save overtime. On many of the lines all but the through traffic is handled by telephone.

Combination Bridge Duplex and Single Line Repeater.

By W. S. Henry.

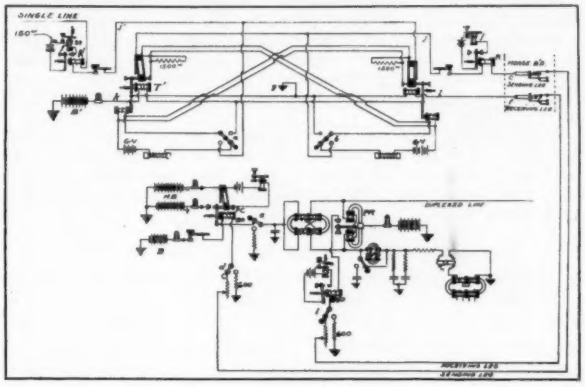
In the accompanying diagram is shown a bridge polar duplex and Athearn single line repeater as used by the American Telephone & Telegraph Co. for repeating from a duplexed line into a single line or vice-versa. To simplify the circuits the cam lever switch associated with the polar relay coil and local circuits, the switches in the main battery circuits, and the condensers and coils for reducing sparking at contacts, have been omitted.

In the actual arrangement the leads *j, j', k, l,* from the repeater set to single lines and batteries, terminate in cords and plugs on the shelf of the so-called Morse board. The set can thus be used in connection with any lines and batteries that terminate in spring jacks.

With the switches in the positions shown in the diagram, the apparatus is arranged for repeating messages arriving over the single line through the single line repeater and duplex apparatus into the duplexed line, or for repeating messages arriving over the duplexed line through the duplex set and single line repeater into the single line.

By inserting the plug, which is shown connected to the sending leg, into a single line jack and the plug shown connected to the receiving leg into a jack connected to a suitable battery, the single line repeater may be used to repeat from one single line into another. Then by turning the switches *a, b* away from each other, the single line is cut away from the duplex set; the single line is then connected through relay *R*, switch *a*, transmitter *I*, and main line battery, *B*, to ground. By connecting plug *c* to another single line and plug *f* to a main line battery, the relay *R* may be used in the other single line.

The duplex set can also be used by turning switches *d* and *e*, to the right. By this arrangement, the duplex is really reduced to a simplex system, because it is only possible to send messages in one direction at a time through both the duplex and single line repeater, but messages can be sent in either direction.



Circuit for Repeating From Duplexed Line Into Single Line.

This combination of duplex set and single line repeater is not as simple as a duplex or half-duplex repeater, but it permits the use of the duplex set without biasing the polar relay. It may be used in cases of extremely low margin on a duplexed circuit where the polar relay would not operate if given a bias. It will also withstand a greater amount of inductive disturbance from single phase alternating current railroad circuits.

Scranton, Pa. W. S. Henry.

Use, Not Location, Should Determine Charges.

The Michigan Railroad Commission has decided the case of a Mt. Pleasant, Mich., physician who complained that he had a telephone in his office and another instrument on the same line in his residence and thought he should be charged only an extension rate for the telephone in his house. The commission held that the extension rate should only apply to telephones on the premises, where the main telephone is located. The Commission also held that the use of a telephone and not its location, shall govern the classification as to rate. It said regarding this: "In the case of a physician with one telephone in his dwelling and another in his office, separate from his dwelling, he should pay the business rate on his office telephone and the residence rate for the one maintained in his residence but, in the case of a physician whose name is carried in the directory with the prefix Dr. or other words designating his profession and who has but one telephone, it should carry the business rate, whether located in his office or in his dwelling."

The pronouncement of the commission signifies that in those instances where business place and residence are combined, the companies may legitimately charge the business rate even if the telephone is within the private dwelling.

Date Set for Referendum Vote on Maine Utilities Act.

Governor Haines of Maine has appointed September 14, 1914, the date of the next general election in that state, as the day on which the public utilities act, passed by the last legislature, shall be passed upon by the people. More than 10,000 voters petitioned for a referendum of the measure, hence the operation of the act was suspended until such time as the popular vote shall endorse it.

Queries on Theory and Practice

Charging a Storage Battery.

"For charging our storage battery, which is a type E., 7 positive and 8 negative plate Chloride accumulator, we charge at the rate of about 38 volts and 33 amperes. Should it become necessary to remove the elements from any one of the 16 cells to clear trouble or to renew same, what would you suggest as the most convenient way to charge that cell without cutting it in on regular charge and out on discharge.

What would you use for resistance to take the place of the other 15 cells in order to charge the cell by itself? In placing a new cell in service, how long should it be before the hydrometer shows the correct reading compared with other cells?"

You can charge the cell by running special leads from the charging dynamo to the cell and giving it current while the rest of the battery is discharging. We assume that your battery has sufficient storage capacity so that you do not need to float it all the time, but can keep up by charging six or eight hours per day or perhaps less. When the run is over, switch the generator onto the special leads to the single cell and keep on charging it the rest of the 24 hours. The generator will have to furnish the charging rate (33 amperes) plus whatever the discharge current may be. This will take care of the single cell without any danger, for it will be charging all the time.

You can doubtless cut down the voltage of your charging generator by means of the field rheostat. Then make up a special water rheostat out of a tub or trough. Use carbon plate electrodes, or iron if carbon is not available. Make a strong solution of salt water and place the plates of this improvised rheostat as near together or far apart as necessary to regulate the current The larger the tub or trough and the larger the plates the less boiling of the water there will be.

You will need about an ohm of resistance to absorb the excess voltage. If you can get hold of a number of carbon plates, stack them on top of each other and apply moderate pressure. This makes a good rheostat.

Iron wire can be used for the resistance. Use small wire and cool it by immersing it in water. The small wire will give the resistance and the water will carry off the heat.

Effect of Bridged Bells on Transmission.

"Would 20 1,600-ohm bells bridged across and near one end of a 4,000-ohm line circuit, shunt 50 per cent. of the voice current? What would be the loss if 20 bells were bridged near each end of the 4,000-ohm line circuit? Through how many miles of standard cable is it possible to talk well with 20 1,600-ohm bells bridged near each end and 20 bells or their equivalent bridged near the middle of the circuit?"

From tests made with voice current, the average impendance of one 1,600-ohm bell is approximately 60,000 ohms. With 20 such bells bridged across one end of a 16-mile, No. 19 gage cable line, a very small loss was noted. When the bells were bridged across the near end only, the loss seemed to be about ½ mile; with the 20 bells bridged across the far end only, there was no noticeable loss; having 20 bells at each end of the line, with 20 bells in the middle, gave about 1.8 miles additional loss.

The bridging of 20 1,600-ohm bells across the one end of a 4,000-ohm line circuit, would give an effect which depends upon the line characteristics, in addition to simple resistance. If open wire lines are considered, it is very likely that the loss will be large.

If we have 20 1,600-ohm bells bridged near each end, and 20 bells near the middle of No. 19 gage standard cable, we can talk nearly as far as at present, although the exact distance has not yet been measured.

Transmitter Battery—Cross Ringing on Grounded System.

"Would Edison batteries work well on a local battery switchboard transmitter and how many would you put on it? How would you connect them to furnish two operators' transmitters with battery?

"I also have a small magneto board of 500 telephones with a grounded system. What size ground should be used? I also have a case of trouble on this system. When parties ring on one of the country lines five or six drops are thrown. Can you explain this?"

Edison battery, both primary and secondary, will work well in supplying current to operators' transmitters. The Edison primary cell (zinc, caustic, potash, copper, oxide) has a voltage of about 0.67 volt, so that to get four volts will require six cells. Moreover, the internal resistance is high enough to cause some cross talk when more than one operator is connected to a set of cells. Usually each operator should have her own battery.

The Edison storage cell has a voltage of about 1.24 volts, although it varies considerably during discharge. Three cells will give you 3.72 volts and four cells nearly five volts. As the internal resistance is lower than the primary cell, you should be able to connect more than one operator to a set of cells.

Your trouble in cross ringing is most likely due to a high resistance ground at the central office. This ground must be very good, and the smaller the number of lines on your board, the lower must be the resistance of the ground connection. If you have waterworks in your town, ground your switchboard on the water pipe. Use two or three good ground clamps such as are advertised in TELEPHONY. Also make a direct ground connection by digging a deep hole to permanent moisture, putting in coke to the depth of a foot, then a copper plate about 18 inches square, or a grounding cone. Solder the ground wire to the plate or cone, and put on another foot of coke or charcoal and fill the hole. The ground wire should be at least No. 10 copper all the way from the switchboard.

Telephones From Top of Cascade Range.

Franklin J. Allen, correspondent of the Portland, (Ore.) Journal at the University of Oregon, recently accompanied a party of engineers to the summit of the Cascade mountains on a trip of inspection of the McKenzie pass road from Eugene through the mountains to eastern Oregon. The automobile bearing the crowd stopped at the head of the pass, more than 7,000 feet high, in eastern Lane county, and Mr. Allen made communication with his paper through what is known by forest service employes as a "fool proof" telephone, one of the indestructible kind that hangs out in the open all winter. The telephone is one of the units of the extensive forest service system.

Saving the Operator Trouble.

Some time ago a small Independent exchange was started in an Ohio town. The telephone directory consisted of a small card with the name and numbers printed on one side, and on the other were instructions as to the use of the service. This was one rule:

"When you call the exchange, tell the operator who you want and what you want them for, as this will save her the trouble of listening in, in order to make proper listing."—Telephone Monthly.

Federal Company's Advantage as a Public Service Factor

President of Successful Western New York Telephone Company Tells Why the Federal Telephone & Telegraph Company Occupies Its Present Strong Position as a Public Utility—The Demand for Service—Situation and Organization—Character of Competition

By B. G. Hubbell

In discussing the value of an enterprise there are a few fundamental conditions to determine in advance of a detailed analysis of the physical and financial condition of the institution under discussion.

1. Is there a general demand for the product or service furnished and is the business permanent and profitable?

2. Is the institution in question so situated and organized that its particular kind of products or service is in demand, and is its plant constructed for economies of production, so as to be able to meet the prices of its competitors?

3. Is its competition of a violent, disturbing and erratic nature, or is the business working generally in a regular and healthy condition?

With these three points determined, an analysis of the business can be made more intelligently. With this thought in mind, I shall dwell on these points generally, as they relate to the Federal Telephone & Telegraph Co., before entering into a discussion in detail of the physical and financial affairs of the organization.

Considerations in Making an Analysis.

The first question may be passed by with but a word. The use of the telephone has reached a point where it can be classed as one of the most, if not the most, important utility now before the public in its business and social life. No telephone company, properly organized, has ever feared the loss of any of its gross incomes. Hard times, extreme political conditions, foreign affairs, panics, and other disturbing conditions which have a depressing effect on the usual run of enterprises, have never adversely affected the income of telephone service and the payments therfor. In fact, in the 1907 panic, the volume of business of the Federal Telephone & Telegraph Company's predecessors, and the collections therefor, were actually greater than in the boom year of 1906.

For answer to the second question, I desire to call your attention to an article in the "Atlantic Monthly" of March by Theodore N. Vail, president of the American Telephone & Telegraph Co., in which Mr. Vail discusses, among other things, the question of class and extent of service which the public requires. Mr. Vail's contention is, of course, for a universal service, and he says that the people must have such service. He does say, however, on page 319, in contending for this class of service, that a plant so constructed is handicapped, in competition with an Independent company. Mr. Vail says: The weakness lies in the fact that an opposition exchange can locate itself in the congested center of business and, at a low rate, give a purely local service, within that section, at a price which the system giving universal service over extended areas, profitable and unprofitable, cannot meet. To those who want a purely limited service in some sections, this appeals. After making this admission, which, to my mind, is the key to the entire telephone subject, the article goes on to say that, of course no one wants a restricted service; that everyone must have a universal service, and, therefore, a restricted service, which can be furnished at a cheaper rate than can the universal service, is not in demand.

The wish for such a condition is father to this thought, often expressed by the officials of the Bell company. It is a theoretical contention, plausible in argument, but thoroughly impracticable in actual practice, as is frequently privately acknowledged. But it is tightly grasped by the Bell, because the abandonment of it would mean the acknowledgment of an inherent weakness in its organization, which would be deadly to its position.

Accepting Mr. Vail's statement as correct, it is apparent that if an Independent company could find a restricted district with well defined geographical trade limits, which it fully covered with its system, it manifestly could furnish a sufficient telephone service for public needs at a cheaper rate than could a company attempting to cover a greater area.

It is this particular condition of operating a comprehensive system within a restricted geographical territory that the Federal company has taken advantage of to an extent not equalled in this country.

It is safe to say there is not another trade center in the United States with so well defined and positive trade boundaries, and which has so strategic a situation for efficient telephone development within a restricted area, whereby a service sufficient for all of the requirements of the population may be given to the general public without the expense of maintaining the elaborate organization and plant development necessary to give the universal service which the Bell company is endeavoring to furnish.

If Lake Ontario and Lake Erie happened to be land instead of water and the Canadian district were a part of the United States, the Federal company would need to have built over practically double the area it now covers in order to furnish the business man of these two large cities his telephone requirements. But because of its territorial conditions the Federal company now reaches to the extremities of these trade boundaries, and is in position to furnish the public with its telephone needs.

I dare say there are 500,000 people in Western New York, counting four people to a telephone, whose daily telephone requirements are perfectly cared for by the Federal company and its associated companies, and who have never found the need of the service of the Federal company's competitor.

The third question, "Is the trade competition normal," can be answered by referring to the advent of the Public Service Commission which took charge of the telephone and telegraph service of New York state on September 1, 1910.

Public Utility Securities and Commissions.

To my mind this is a most helpful control and it adds very materially to the safety of the securities issued by telephone companies. I know of no better class of security than that of a public utility, particularly one which furnishes a service so much in demand as the telephone. I should hesitate to buy any securities or recommend any such securities which were not under a state public service commission control.

With two telephone companies in the state of New York, both supervised by the same commission to prevent disastrous rate cutting and unfair practices, competition really

becomes an advantage to the public and competitors alike.

Public service commission control insures against unfair methods prevalent in sharp and active competition and relieves the competing company of the fear that its competitor is taking advantage of it, by doing things which will place it at a disadvantage.

On the other hand, the keen competition of an active competitor brings forth the highest degree of personal endeavor and efficiency. This makes for high corporate achievement and the favorable results of it are shown in low operating costs and superior service to the public at the lowest possible rates.

I have been engaged in public utility work for a considerable number of years. I consider it the most substantial of all lines of business, supported, as it is, by a rapidly increasing public, eagerly seeking out its service at prices which will permanently sustain it and pay a fair return on the investment. But I should not be willing to purchase or recommend a security of such a utility unless it was governed by public service commission control, either state or national. And I should prefer a security of a competing company, operating under such control, to the security of a monopoly of such a business without a public service commission control, or even with it.

From Factory and Salesroom

A Numerical Timepiece for Telephone Exchanges.

The accompanying illustration shows a novel style of clock supplied the Chicago Telephone Co., for use in connection with its new rapid service on "A-B" switchboards at surburban exchanges on calls to and from the city.

The New Baird Clock.

When a patron tells the "A" operator in a suburban town that he wants a Chicago connection, she is enabled to make the call direct, instead of turning it over to a toll operator. As soon as the connection is complete, she notes on the ticket the time, as shown by the numerical clock which changes every tenth of a minute. When the patron is through talking, the operator again writes down the time and by a very simple deduction, computes the elapsed time to the tenth of a minute. This in turn can quickly be reduced to its money value.

The clock is the invention of E. P. Baird and is manufactured by the Baird Equipment Co., 3231 North Clark St., Chicago.

The operating power for the "self-winding" clock movement is secured from the storage battery in the exchange. Once a minute it closes a contact and the spring is rewound by a magnet. Another contact closes every tenth of a minute and two powerful magnets actuate the numerical cylinders.

The clock is located at one end of the switchboard, where all the operators can read the time. As the figures are 2¾ inches high, the time can be clearly read from the most distant position on the switchboard.

The first clock of this type was installed in the Oak Park, Ill., exchange of the Chicago Telephone Co. last October and has operated so successfully that other exchanges are now being equipped with them.

Fall River Automatic in Service Twelve Years.

An interesting event in the telephone world occurred recently when the automatic exchange at Fall River, Mass., completed its twelfth year of service. This apparatus was installed during June and July, 1901, and has been continuously in operation since that time. Fall River has the distinction of being the oldest automatic plant operating today, but it leads by only a small margin, for eight other exchanges, those at Dayton, Ohio, Grand Rapids, Mich., Lake Benton, Minn., Manchestor, Iowa, Medford, Wis., Portland, Ore., and St. Marys, Ohio, have been in existence for ten years or longer.

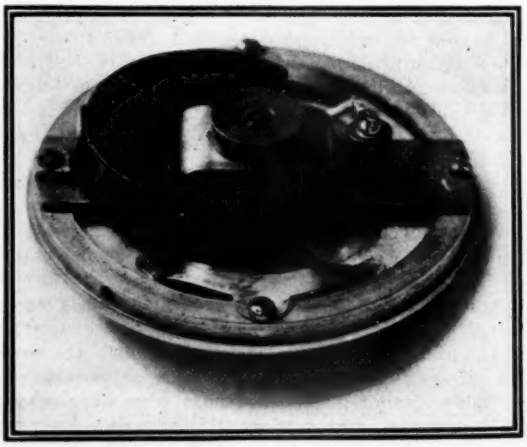
There was a time not so very many years ago, when automatic telephony was regarded by many engineers as a new and untried experiment, but the Fall River record may fairly be said to refute this claim. As the advocates of the automatic say: "An apparatus which has successfully undergone 12 years of commercial operation, is no longer an experiment. It is a fact."

The Booster Telephone Transmitter.

A telephone transmitter different from those in common use has been invented by C. C. Terhune, of Platte, S. D., and its appearance is shown in the accompanying illustration. It is known as the "booster" transmiter and its distinguishing feature consists of a permanent magnet so mounted that its poles will have about 1/32 inch clearance from the transmitter diaphragm.

The magnet may be of various shapes and sizes, adapted for use with any standard make of transmitter having an iron diaphgram.

The inventor contends that this transmitter will give better transmission with one dry cell than obtained from the usual type of transmitter with two cells, and also that the cell life will be one-third longer. It is adapted for local or long distance use and will, it is said, operate equally well with a curcent of one ampere or 40 amperes. Another claim made for the transmitter is the low cost for manufacturing and its simplicity. The tests which Mr. Terhune has made wtih the transmitter have been extremely satisfactory.



View of Booster Transmitter.

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Four sturdy blades that cannot break, bend or crack.

The blades are convex. This gives them still greater holding power than plane or concave blades because the lines of resisting force are perpendicular to the surface.

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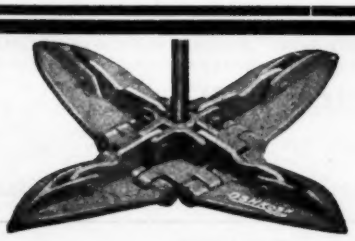

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OUR W. & M. Telephone Wire is drawn from metal made especially for the purpose and rigidly inspected. The spelter is carefully laid on with uniform thickness, ensuring ample protection for the wire under extreme weather conditions.

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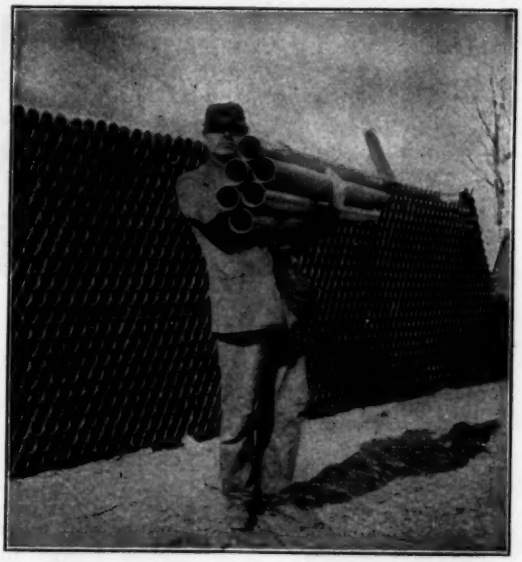

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Please tell the Advertiser you saw his Announcement in TELEPHONY.

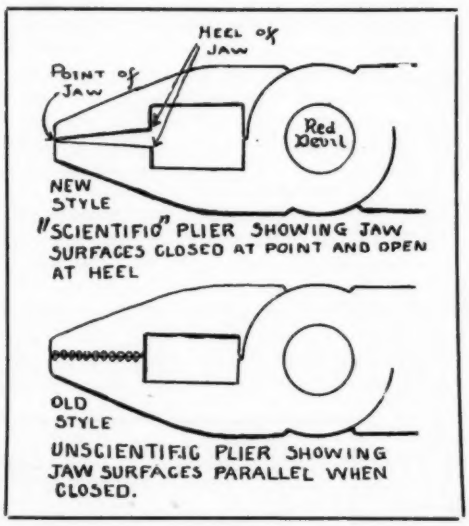
Scientific Plier Building.

One of the most universal and commonly known tools is a pair of pliers, but it remained for an expert, who has been in the plier business for over 30 years, to apply principles, said to be scientifically correct, to the manufacture of pliers. There are a number of interesting points to be considered in connection with the evolution of a scientifically constructed pair of pliers.

Beginning with the "nose" of the plier, the part to which the arrow points in Fig. 1, the leverage power of this tool is mathematically ascertained. The nose is constructed so as to give it a 50 per cent. insurance, that is, the nose is brought down to such a size that when the extreme weight is exerted normally on the handles, the nose will stand 50 per cent. more strain before breakage.

Ordinary pliers are milled perefectly straight from the throat of the pliers to the end as seen in Fig. 2, whereas to insure perfect holding qualities, the inside of the nose should be milled, it is contended, on a true 45 deg. angle as in Fig. 3. To the scientific plier expert, the old style milling is just as rational in plier building as putting a hammer head into the center of the handle instead of on one end.

A pair of pliers is nothing more nor less than a hand vise, and in the construction of scientific pliers, the jaws are so


HEEL OF JAW
POINT OF JAW
Red Devil
NEW STYLE
"SCIENTIFIC" PLIER SHOWING JAW SURFACES CLOSED AT POINT AND OPEN AT HEEL
OLD STYLE
UNSCIENTIFIC PLIER SHOWING JAW SURFACES PARALLEL WHEN CLOSED.

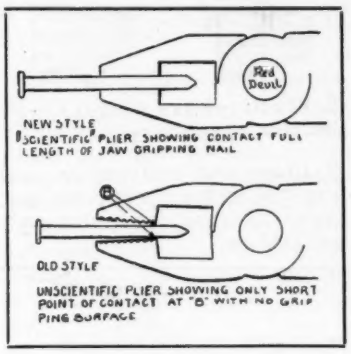
Figs. 1 and 2.

milled that they will parallel on any round or square object up to the limit of the size of wire or other material they are supposed to cut. This is illustrated in Figs. 1 and 3, which show the "Red Devil" pliers. Here the closed plier is shown milled to a V shape. When a nail is inserted, as in Fig. 3, the object is gripped along its entire surface. When, however, the jaws are parallel, as in Fig. 2, there is only one point of contact, as in Fig. 4, when a nail is inserted.

The "throat" of the pliers, or the opening back of the cutting edge, must be so milled that it cleans itself. The "Red Devil" is so constructed, and, by taking a clear 33 1/3 deg. sweep through the jaws, it cleans itself so, it is said, that no clogging of rubber insulation or other material can catch in the cutting edges, or hold the pliers apart.

The cutting edges or severing jaws of the plier must be raised 1/64 in. above the surface so as to insure perfect cutting edges at all times. The "Red Devil" being so constructed, there is a slight grinding operation on the nose that prevents the jaws coming together for a number of years. This results in a tool of utility, not only for the period that ordinary pliers are supposed to last, but by slightly grinding out the nose of the pliers, the cutting edges can again be brought together, giving, it is claimed, five times the ordinary length of life, yet insuring perfect cutting for this entire length of time.

For a number of years, what was known as a "box joint," or one member passing through the other, as in Fig. 5, was considered the strongest tool made. However, actual tests of


Red Devil
NEW STYLE
"SCIENTIFIC" PLIER SHOWING CONTACT FULL LENGTH OF JAW GRIPPING NAIL
OLD STYLE
UNSCIENTIFIC PLIER SHOWING ONLY SHORT POINT OF CONTACT AT "B" WITH NO GRIPPING SURFACE

Figs. 3 and 4.

both tools on a straining machine, are said to have proven that the round joint is superior. The reason is that the two members of the round joint pliers are milled and ground scientifically, as in Fig. 6, so that they mesh together perfectly. This gives them a bearing surface, both top and bottom, or on both sides. In addition to this large bearing surface, a very large hard rivet is used, forming a perfect axle with the bearing on the outer edge and making it run as true as an automobile bearing.

Fig. 7 shows the scientific construction of the handle of a "Red Devil" plier. The essential point in handle construction is to get the greatest leverage possible for the size of the tool. In the construction of this plier, the handles are opened up and give the full benefit of all the leverage without sacrificing the strength of the tool. The scientific handles are constructed, it is stated, only by the "Red Devil" tool factory and this new, scientific construction is revising the company's entire line of manufacture of 3,800 styles, finishes, and sizes of pliers. The company has taken the anatomy of the human hand and planned out a construction for the different sizes of handles so as to conform to the uneven surfaces of the hand. From the smallest tools to the largest, from the 3 in. size up to the 12 in. size, the handles are being made along these lines. This is very much appreciated by the mechanic when he realizes that without additional effort, he secures 20 per cent. more leverage power on this tool.

In the "Red Devil" pliers the handles are slightly ovaled on

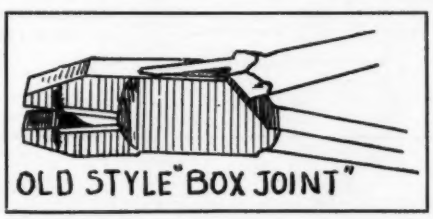


Fig. 5.

the inside and opened up entirely to the joint so as to give greatest clearance for the hands. This makes it a physical impossibility for pinch blood blisters on the thumb and first finger. This point is clearly illustrated in Figs. 8 and 9.

The material of which these pliers are made is "Swedish analysis" steel, of which the base is "charcoal iron."

A practical test of "Red Devil" tools shows surprising results. For example, the ordinary small pocket pliers that are

supposed to cut No. 16 or 18 copper wire, will cut as high as No. 8 gauge steel wire, and the ordinary linemen's "Red Devil", commonly known as the 8 in. and 9 in. side cutting plier, will cut a 3/8 in. drill rod. It is obvious that to cut a drill, made to bore through the hardest kind of iron and steel,

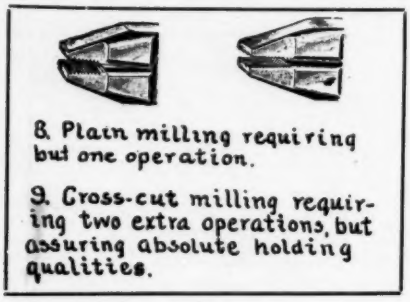

8. Plain milling requiring but one operation.
9. Cross-cut milling requiring two extra operations, but assuring absolute holding qualities.

Fig. 6.

requires a combination of skill and material of some very superior mixture.

The finish of "Red Devils" is in keeping with the tool, the handles being a dark gun-metal finish, as in a high grade shotgun, and the heads having a very high polish almost like nickel plate.

The "Red Devil" tools are manufactured by the Smith & Hemenway Co., 150-152 Chambers St., New York, N. Y., representatives and owners of the plant.

Each "Red Devil" must go through some 60 or more operations and be subject to many inspections before the tool is considered worthy of the "Red Devil" stamp.

Efficiency Methods in Stromberg-Carlson Plant.

The Stromberg-Carlson Telephone Mfg. Co., of Rochester, N. Y., has always endeavored to progress as result of sound business methods. From time to time it has eliminated such lines of manufacture as have been found to be unprofitable and not conducive to efficiency and economy in the operation of the plant.

An announcement along these lines that is of considerable interest to the telephone field, has just been made. It is that the company has decided to discontinue the manufacture of paper insulated, lead covered cable and will concentrate the efforts of its entire organization on the production of switchboards, telephones, and other closely related products, which have formed the main part of its business.

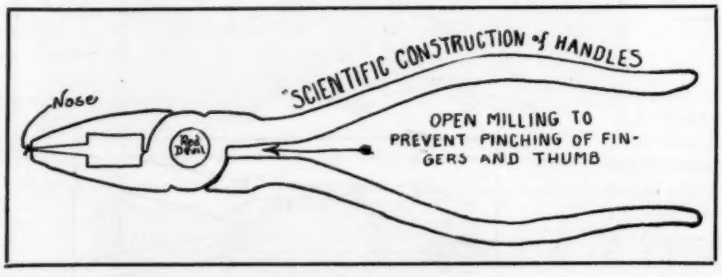
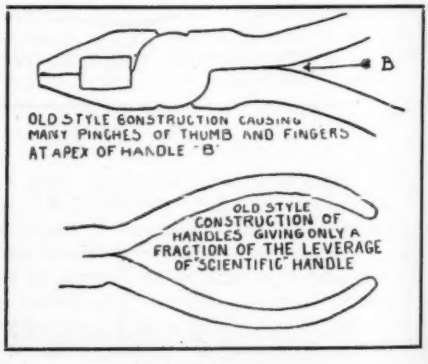


Fig. 7.


B
OLD STYLE CONSTRUCTION CAUSING MANY PINCHES OF THUMB AND FINGERS AT APEX OF HANDLE "B"
OLD STYLE CONSTRUCTION OF HANDLES GIVING ONLY A FRACTION OF THE LEVERAGE OF "SCIENTIFIC" HANDLE

Figs. 8 and 9.

The paper and lead covered telephone cable machinery has been sold to the Eugene F. Phillips Electrical Works, Ltd., of Montreal, Can., the Canadian plant established by the American Electrical Works of Phillipsdale, R. I., in 1889. All inquiries received for paper insulated, lead encased telephone cable by the Stromberg-Carlson company will be referred to the American Electrical Works.

The Stromberg-Carlson company has been manufacturing switchboards and telephones for more than 20 years and its business so far this year has been considerably larger than the corresponding period last year. It goes without saying that the company will continue to maintain the high standard of its "Quality Apparatus."

Paragraphs.

HENRICI, KENT & LOWRIE, consulting engineers, of Kansas City, Mo., have drawn up plans and specifications for telephone exchanges at Lee's Summitt and Greenwood, Mo., of the Prairie Telephone Co., covering the installation and all the material to be used in the plants. They have also just completed a large telephone appraisal.

Keokuk, Iowa, Commissioners Pass Lower Rate Ordinance.

When a telephone ordinance, backed by an initiative petition of 1,647 names and providing for lower rates, was presented to the Keokuk, Ia., council it was promptly passed. The passing of the ordinance was no surprise to the leaders of the fight for lower rates, although they did not expect such prompt action from the council.

By the terms of the ordinance passed by the council, the rate for one party telephone is reduced from $3 per month to $1.50 and the rate for a residence telephone is reduced from $2 per month to $1. Proportional reductions are made for two or more party lines. The ordinance further provides that if rent be paid in advance for a period of a month, a quarter or longer, a reduction of not less than 5 per cent. shall be given. It makes a one or two-party line optional and also provides that any company operating within the city without franchise shall be liable to a fine of $100 a day and more than one offense may be included in the charge.

The passing of the ordinance marks the first use and victory under the commission plan of government in Keokuk, and probably the first in the state of Iowa of any consequence. It is the culmination of a fight begun by a few men for lower rates several months ago, following the raising of the telephone rates after the consolidation of the Mississippi Valley and Iowa telephone companies.

Mayor Pro Tem Thos. P. Gray stated that the council had not entered into the merits of the ordinance. When the petition was presented with the signatures of nearly half of the voters of the city, the council believed that it was its duty to pass it.

What the Iowa Telephone Co. will do is not known to the local officials of the company. The legal department of the company at Des Moines, communicated with the council citing the law under which it denies the right of the council to enforce such an ordinance.

It is understood that the men who lead in the movement to pass the ordinance, will demand that it be enforced and a legal battle between the company and the city is expected.

In the Rural Line Districts

The ladies on the line of the Lyle & Clyde Bum Telephone Co. say that they are going out to fix up the line as the men will not do it. I will wager a new spring bonnet that they can not hang the line in more graceful curves than it has been hanging in for the past two years.—Lyle Item, Medford (Okla.) Star.

A new switchboard was installed for the Groton-Ferney Telephone Co. at this place and now it is hoped the patrons will receive good service for a while at least.—Columbia Item, Aberdeen (S. D.) News.

The members of the Independent telephone line are putting in new poles and rebuilding their telephone lines. We will have good service for a while.—Dark Corner Item, Warrensburg (Mo.) Journal.

A fresh lot of batteries for telephone use have just been received at the telephone central office. Let each one come in and get their batteries now and see if we cannot improve our telephone service. You can't imagine how much a new set of batteries will improve your service.—Northrop Item, Fairmount (Minn.) Sentinel.

Two carloads of telephone material have been received here for several rural lines which will be constructed through the Leola territory.—Leola News, Sioux Falls (S. D.) Argus-Leader.

A telephone has been installed here which is an improvement needed a long time.—March Center News, Pocatello (Id.) Tribune.

The Glendale Telephone Co. has a new subscriber. A woodpecker has a claim by undisputed possession of a decayed pole wherein to rear its young.—Cumback Item, Washington (Ind.) Democrat.

Our telephone lines have been so recently readjusted that we hardly know "where we are at."—Franklin News, Cincinnati (Ia.) Review.

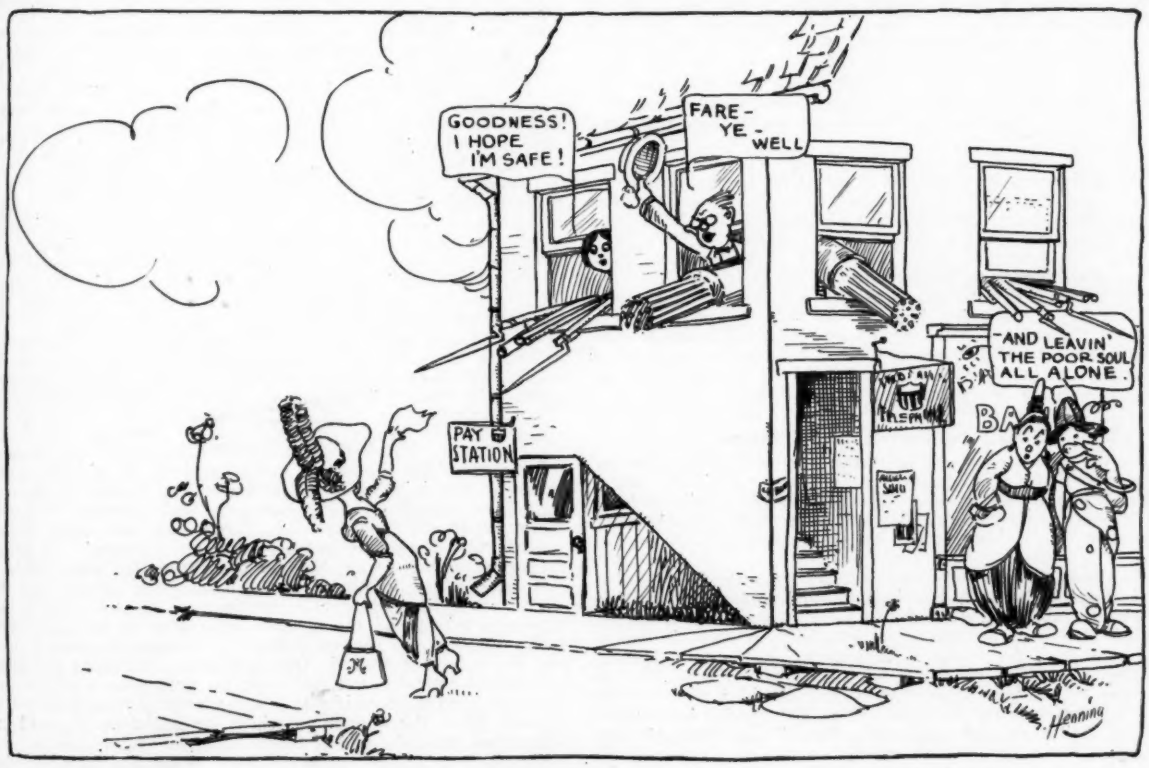
The new switchboard for the new office of the Lincoln Telephone Co. arrived last week. Some difficulty was experienced in getting it up the stairway at the Signal office, but this was accomplished and the work of installation will proceed as rapidly as possible.—Geneva (Neb.) Signal.

The telephone meeting held last Wednesday was quite well attended, those present taking great interest in having the line built at the earliest possible moment. Practically all the farmers along the proposed route want a telephone. Mr. Chapman of Echo was present and addressed the meeting.—Underwood Township Item, Vista (Minn.) Censor.

The West Lawn telephone system at Leeton has undergone some extensive improvements and the Times asserts it is the best in the land. John Callison is the expert fixer on West Lawn job.—Warrensburg (Mo.) Journal.

Mr. Warnack, south of town, has a bunch of men busy putting on more telephone wires between Revere and Westbrook.—Revere (Minn.) Record.

The directors held their annual telephone meeting Saturday afternoon. They hired Mrs. Lydia Sturdevant for the ensuing year for a hundred dollars. Mrs. Laura Mallatt has been the central operator for nearly 5 years and has given good service and general satisfaction but she could not afford to run it for the price.—Pawnee News, Bethany (Mo.) Clipper.



The Blakesburg Telephone & Telegraph Co. is in a predicament. Its exchange is located over the bank and there is but one girl in town who has backbone enough to be night operator and stay alone in the exchange. She now wants a vacation and the telephone company is at a loss to get another operator. It is said that Mr. Snow has induced one of the day operators to take care of the board at night, but only after making all kinds of promises of putting in cannons and machine guns.—Blakesburg Item in Ottumwa (Ia.) Press.

Legal Cases and Decisions

By A. H. McMillan

Light and Traction Companies Different as to Injunction.

"We note in your issue of July 26, under heading, 'More Induction,' that your opinion in answer is altogether different to what it was when we asked practically the same question and which you answered in issue of June 7, 1913, under heading, 'This Is Damage for Induction.'"

We think the two cases exactly alike but in your answer of July 26 you infer that the transmission line is a street railway. In our case it is not, but is simply a line over 100 miles in length, carrying 60,000 volts and intended to operate at 110,000 volts. It runs from a water power plant in the eastern part of the state to supply that and other cities with current for all purposes. The transmission line does not run along any streets or highways, but through farms, fields, woodland and mountains, along a railroad right of way. The company has bought a 100 ft. right of way, but has no title to the property for any purpose other than the right to clear the land of timber, construct and maintain its line. Its line, of course, crosses the highways and parallels them in some places. In doing so it crosses and parallels our lines and in one instance, parallels one of our lines, where our line is also on private property. The owner, being a stockholder in our company, gave us the right of way through his fields. Six years later he sold the power company, the right of way to build its lines through the same fields but the point where they cross our line is on the highway. We have a charter from the state which gives us the right to build and maintain a telephone system and to secure the necessary right of way We have paid no money for the right of way, but the county authorities have given us permission to build our lines along the highways of the county. Where we have crossed private property, we have the owner's consent. We are going to bring suit and wish to know if you think we can recover damages.

We find that a grounded line running in the same general direction with this power line a mile away gets plenty of noise, and it is simply impossible to use a line that is as close as 100 yards for any distance. We also find that metallic lines that cross this line twice, are very noisy and we have one that crosses but once that has a great deal more noise than we like. We find that tree trimming and transposing does but little good."

The difference between our conclusions in the article of June 7 and that of July 26, is berause we supposed that the later query referred to a traction company, while the former clearly referred to an electric light company. There is a marked distinction between the two. A traction company makes what is not an unusual use of the street, but one for which streets are intended, namely, travel, while a light company makes a use of a highway for which it was not intended. Hence, a telephone company is entitled to more protection against a light company than it is against a traction company. In the case as you now state it, we certainly think you are entitled to damages.

Voting by Person or by Shares.

"In the by-laws of our company are provisions whereby only four shares can be held by one person and any shareholder has but one vote regardless of number of shares held. Do the laws of Kansas sustain such provisions? Any information on this subject will be appreciated."

We think the matter mentioned can properly be provided for in your by-laws. While it is unusual to provide that one stockholder shall be entitled to one vote for each share of stock held, it may be otherwise, provided that there is reason for doing so. We know of nothing in the laws of Kansas contrary to such provisions, but it would be advisable for you to write to the secretary of state and obtain a copy of the last corporation laws. If such laws should provide how stockholders shall vote, they must be followed regardless of your by-laws.

Taxation in Iowa.

"I wish you would advise me through your paper as to the taxations of a telephone system. Is there any other tax to be paid than there is on other property such as real estate? Also what reports, if any, are to be made to the state. Where can we secure a reliable copy of the telephone law in Iowa?"

The laws concerning taxation change so rapidly that we cannot safely advise you on this subject. You may obtain a copy of the telephone laws of Iowa by writing to the secretary of state. You may get a copy of the taxation laws in the same way. Unless there is a provision for the specific taxation of telephone property, it is taxable the same as other property in the state.

Protection from High Tension Wire.

"We have one light and power company coming in and across our couinty with its high tension wires. The poles are now set in our telephone leads. They expect to string the copper wires soon, No. 4—carrying 13,000 volts. Their poles are 25 and 30 ft. only set in the ground on an average of 3½ ft. deep. Their construction work is very ordinary. The poles are in the public highway. There have been four people killed by the power since February 1, 1913, but they carry insurance and seem to care naught. If you have anything to give us so that we could protect ourselves from them at once, we would appreciate it. We have not been able to get any advice or find any court decisions in regard to this matter."

Between electric light and power companies and telephone companies, the line first rightfully in possession is entitled to protection against interference by induction on the part of the one subsequently erected. For any damages caused by induction, the latest established company is liable; and the company injured is also entitled to an injunction to restrain the electric company from stringing its wires in proximity to those of the telephone company. The subsequently licensed company is under the duty to so maintain its wires and lines as not to interfere with the prior occupant's right to properly operate its lines and to transact the business authorized by its franchise. McMillan on Telephone Law, section 137; Joyce on Electric Law, section 517; Jones on Electric Law, section 517; Nebraska Telephone Co. vs. York Gas & Electric Light Co., 27 Nebraska 284, 3 American Electrical Cases 364, 43 Northwestern 26; Western Union Telegraph Co. vs. Guernsey & Scudder Electric Light Co., 46 Missouri Appeals, 120, 3 American Electrical Cases 425; Ferris Electric Light & Railway Co. vs. Southwestern Telegraph & Telephone Co., 5 American Electrical Cases 262; Simmons vs. Southern Gas, Electric Light & Power Co., 41 Southern, 248.

Our advice is for you to seek an injunction to restrain the power company from so building its lines as to endanger or interfere with your line. The danger of its construction can be shown by affidavits of telephone and electrical experts, its construction work described, and even the accidents in which people have been killed set forth.

The decision of Judge Harris referred to in TELEPHONY September 21, 1912, is an encouraging precedent. You could undoubtedly obtain such a decision from the court as would require the electric light company to build its lines safely.

Effect of Insulation.

In a telephone lineman's action against an electric light company for injuries from a defectively insulated electric light wire, the electric light company, by its answer, brought in the telephone company. It alleged that the condition of its wire was due to a telephone cable which sagged and came in contact with its wire, but did not allege that such contact was contributory negligence on the part of the lineman.

The court charged that if the lineman, by any knowledge of the proximity of the electric light wire to the telephone cable, failed to use that care which an ordinarily prudent person would have exercised, if such failure contributed to cause his contact with the insulated wire, the jury must find for the electric company, notwithstanding its negligence; that if the lineman knew the danger to which he might be exposed in descending the pole, and if in so doing he did not act as an ordinarily prudent person would have done, and was thereby guilty of negligence, he could not recover, and that all the circumstances in evidence tending to throw light on his acts must be considered. The appellate court upheld this charge as a proper statement of law. Snyder Ice, Light & Power Co. vs. Bowron, 156 Southwestern, 550.

Condensed News Reports

Officers of Companies are Earnestly Requested to Forward Us Promptly All Financial and Other Statements as Soon as Issued, and Any Items of Interest as to Their Plants and Systems

Personal.

R. L. HILDECKER has been appointed manager of the Rock River Telephone Co. at Rochelle, Ill.

W. HINZ, of Oshkosh, Wis., has been made local manager for the Wisconsin Telephone Co. at Delavan, Wis.

C. H. MOORE has been made local manager of the Gainesboro Telephone Co., at Somerset, Ky., succeeding P. Woodridge, resigned.

J. R. BROHAWK has been promoted from the position of cashier for the Chesapeake & Potomac Telephone Co., at Baltimore, Md., to that of sales manager, a new created position.

C. J. RAPPARLIE, manager of the Defiance, Ohio, office of the Central Union Telephone Co., has been transferred to Toledo, where he will act as special agent for the company.

HARVEY M. ALLEN, superintendent of the United Telephone Co., at Bellefontaine, Ohio, has resigned to accept a similar position with the Home Telephone Co., at Portsmouth, Ohio.

C. J. RAPPARLIE, who, since the first of the year has been manager of the Defiance, Ohio, office of the Central Union Telephone Co., has been transferred to Toledo, where he will act as special agent for the company.

J. P. HAMILL has resigned the management of the Wyandotte and Trenton exchanges of the Michigan State Telephone Co. and will resume his former work in the structural steel business. E. N. Hardy has been appointed to take his place.

SAMUEL J. BLIGHT, contract manager for the Chesapeake & Potomac Telephone Co., at Baltimore, Md., has been promoted to the position of district manager. Mr. Blight will have charge of all inside work of the telephone company in that city and neighboring countries.

GEORGE A. FRENCH, general manager of the Duluth Telephone Co., Duluth, Minn., a subsidiary of the Bell company, has been promoted to district commercial manager of the Northwestern Telephone Exchange Co. with headquarters in Minneapolis. He will be succeeded by F. E. Lister, present general manager at Virginia, Minn.

J. A. HALLIDAY, for the last three years manager of the San Francisco, Cal., office of the Pacific Telephone & Telegraph Co., has been appointed district commercial superintendent of the Oakland district, with headquarters in Oakland, to succeed H. C. Brownlee who has been transferred to the San Francisco division.

J. G. SPRINGER, district contract agent for the Pacific Telephone & Telegraph Co., at San Francisco, Cal., has been appointed manager of the San Francisco office, succeeding Mr. Halliday, who has been promoted to district commercial superintendent of the Oakland district. Mr. Springer's successor is T. A. Brooks, formerly of Bakersfield.

GENICHRO OHATA, electrical engineer for the Imperial Department of Communications, Tokio, Japan, has arrived in San Francisco and will make an extended trip over the United States. Mr. Ohata is studying power and telephone transmission and the relations of the power and telephone companies as regards inductive interference.

Obituary.

JAMES R. WILEY, Western manager of the Standard Underground Cable Co., died recently in Chicago. Mr. Wiley was born in Newark, Knox county. Mo., in 1847, and was a graduate of the St. Louis City University. He was one of the pioneers in the telephone business, having held responsible positions with the Metropolitan Telephone Co., of New York, now the New York Telephone Co., from 1878 to 1895. In that year he went to Chicago to act as Western manager for the Standard Underground Cable Co., which position he held at the time of his death. Mr. Wiley had been ailing for some time with pneumonia and the last few months were spent in the East at Cape Cod.

He was a member of the Chicago Association of Commerce, Chicago Electric Club and the Telephone Pioneers of America, and had a great many friends in the electrical and telephone business.

New Companies and Incorporations.

LOS ANGELES, CAL.—(No other address given.) The Hanson Wireless Telephone & Telegraph Co. has been incorporated by Charles L. Hanson, Harry LaVerne Twining and Lucius M. Hall. The capital stock is $25,000.

AITKIN, MINN.—A new company has been formed which will connect with the Aitkin-Deerwood line at Aitkin. The officers and directors of the new company are as follows: President, F. M. McGarry; treasurer, Miss Louise Chute; secretary, P. T. Waldeck; directors, John Perkins and C. C. Sutton.

PINGREE, N. D.—Articles of incorporation have been filed by the James River Rural Telephone Co. with $25,000 capital stock. The incorporators are Henry Meyer, Henry Dehne and Fred Farr, all of Pingree.

VERONA, N. D.—The West Verona Telephone Co. has been incorporated with $3,000 capital stock. The incorporators are Geo. Wendlond, J. B. Schroedl and F. B. Lemma, all of Verona.

PIERRE, S. D.—The secretary of state has chartered the Wayne & Rosedale Telephone Co., a rural line to be maintained from Alexandria, Hanson county, to Wayne and Rosedale townships, with a capital stock of $1,000.

PARKER, WASH.—The Parker Farmers Co. has filed articles of incorporation here. It is capitalized at $1,000 and is empowered to build and operate telephone lines. B. D. Sloop, W. F. Medaris, M. E. Murphy, W. L. Crowell and J. F. Medaris are the incorporators.

PLYMOUTH, WIS. (No other address given)—The Spring Farm Telephone Co. has been organized and officers have been chosen as follows: President, M. E. Keyes; vice-president, George Jurss; secretary-treasurer, Wm. Bein; manager, Steve Payne.

STEVENS POINT, WIS.—Articles of incorporation have been filed by the Sharon Farmers Telephone Co. with $5,000 capital stock. The incorporators are: Aloit Firkus, Joseph Okray of Stevens Point, and J. J. Omernick of Custer, Wis.

Construction.

STUTTGART, ARK.—The Rice Belt Telephone Co. will expend $5,000 improving its plant, installing a switchboard, extending wires, etc.

SAN BERNARDINO, CAL.—Government telephone lines are to be extended from Fredalba into Green Valley.

INDIANAPOLIS, IND.—A building permit has been granted to the Indianapolis Telephone Co. for the erection of a four-story concrete exchange building to cost approximately $35,000.

HOUGHTON, MICH.—It is reported that the Michigan State Telephone Co. is preparing to entirely rebuild its plant in this village.

ELGIN, ORE.—The Eastern Oregon Co-Operative Telephone Association is considering the issuance of $30,000 in bonds to be used in the construction of telephone lines in this vicinity. J. McKinnis, of Imbler, is president, and Jesse Crum, Elgin, is secretary of the company.

TYLER, TEXAS.—The Southwestern Telegraph & Telephone Co. plans the erection of a new three-story exchange building in this city.

SEATTLE, WASH.—The application of B. H. Carter and the Pioneer Farmers Telephone Co. for a permit to erect and maintain a telephone pole line on country roads has been granted.

SEATTLE, WASH.—The Pioneer Farmers Telephone Co. has been granted a permit to maintain a telephone pole line on country roads.

Franchise.

COLUSA, CAL.—The Colusa County Telephone Co. has made application to the board of supervisors of Sutter county for permission to erect poles and lines and maintain a telephone system in that county.

PATTERSON, CAL.—The Railroad Commission of California has granted a certificate of public convenience and necessity to J. H. Evans, who now operates a telephone system at Patterson, Stanislaus county, to make extensions of his system in the vicinity of Patterson. The franchise therefor is yet to be secured from the board of supervisors of Stanislaus county.

SOUTH PASADENA, CAL.—A franchise for 40 years has been

granted to the Home Telephone Co. and work will begin in a few days on the installation of cable.

STRATFORD, IOWA—The city council has granted a 20-year franchise to the South Marion Telephone Co. to erect and maintain its poles and wires on the streets and public ways of this city.

PROCTOR, MINN.—The Zenith Telephone Co., with headquarters at Duluth, Minn., has been granted a 20-year franchise to operate its lines in this city.

CENTRALIA, WASH.—The county commissioners have granted a franchise to the Hanaford-Skookum Telephone Co. to operate a telephone line in the north end of the county.

COLFAX, WASH.—Franchises have been granted to three new telephone companies to do business in Whitman county by the county commissioners. The Inland Independent Telephone Co. is a branch of the Independent company which had headquarters in Spokane. The other companies are the La-Crosse Telephone Co. and the Lamont Telephone Co., both of which have their head offices at the towns from which they operate.

STANWOOD, WASH.—The Cedarhome Telephone Co. recently applied to the county commissioners for a franchise covering some four or five townships. If granted, lines will be constructed at once.

Financial.

ELLIOTT, ILL.—The Dix Telephone Co. has increased its capital stock from $6,000 to $12,000.

HOOD RIVER, ORE.—The Home Telephone Co. has changed its name to the Oregon-Washington Telephone Co. and increased its capital stock to $150,000.

TACOMA, WASH.—The Sound Telephone Co. has increased its capital stock from $5,000 to $10,000.

WHEELING, W. VA.—The Consolidated Telephone Co. has filed an amendment to its charter and will increase its authorized capital stock from $500,000 to $3,000,000. The company plans improvements and extensions.

BLACK EARTH, WIS.—The Black Earth Telephone Co. has filed an amendment to its articles of incorporation, increasing its capital stock from $4,500 to $6,780. A. A. Mickelson is secretary and Albert Dybdahl president.

Elections.

GRAYSLAKE, ILL.—The following officers and directors have been elected for the Avon Telephone Co.: president, Arthur Leng; vice-president, George Kapple; secretary, R. W. Churchill; treasurer, Ebenezer Harris; and directors, Arthur Leng, George Kapple, Fred Wright, George Strang and Eugene Wilton.

CEDAR RAPIDS, IOWA—The annual meeting of the Cedar Rapids & Marion Telephone Co. was held recently and resulted in the re-election of J. M. Rider as president and manager, and the re-election of practically all of the present officers of the company. A number of important changes and improvements were also talked over, but nothing definite was decided.

MT. PLEASANT, IOWA.—The Mt. Pleasant Telephone Co. held its annual meeting recently and elected the following directors and officers for the coming year. Directors, Dr. A. O. Pitcher, F. B. Montgomery, J. M. Green, Chas. A. Gregg and C. S. Smith; president, Dr. A. O. Pitcher; vice-president, J. M. Green; secretary, Chas. A. Gregg; treasurer, Fred von Hon.

HIAWATHA, KANS.—The Comfrey Rural Telephone Co. held its annual meeting and the directors elected the following officers: Andrew Steinmetz, president; Oscar Thor, vice-president; H. D. Reed, secretary and G. W. Schaffer, treasurer.

ST. PETER, MINN.—At a meeting of the Nicollet County Telephone Co., held recently, the following were elected directors for the ensuing year: M. B. Johnson, C. W. Carpenter, H. J. Essler, John Clark, Andrew Anderson, Andrew Nelson, Henry Knipple and C. C. Nelson.

LACONIA, N. H.—At the annual meeting of the Winnipesaukee Telephone Co. the following officers and directors were elected for the ensuing year: Fred W. Story, president; Charles W. Vaughn, vice-president; Henry T. Turner, manager; F. W. Story, C. W. Vaughn, C. W. Adams, Joseph N. Keller, W. F. Knight, W. R. Driver, Jr., George H. Dresser, Carl T. Keller and N. B. Jones, directors.

MT. UPTON, N. Y.—At the annual meeting of the Unadilla Valley Telephone Co., U. S. Pearsall of Mt. Upton was elected president and F. W. Winsor vice-president. The board of directors and secretary and treasurer were re-elected. A resolution was passed to build a trunk line to South New Berlin, the large and increasing number of subscribers making it necessary.

MT. BLANCHARD, O.—The People's Telephone Co. has elected the following officers: president, B. F. Seitz; vice-president, Howard Humphreys; secretary, Mrs. Nora Sampson; treasurer, N. N. Crawford; and general manager, Oscar Wise.

GLEASON, TENN.—At a recent meeting of the Gleason Rural Telephone Co., W. R. Hawks was elected president and J. P. M. Deck, secretary.

PORTLAND, TENN.—The stockholders of the Portland Mutual Telephone Co. met recently and re-elected the old officers for the ensuing year as follows: J. W. Marlin, president; F. C. Enders, secretary and treasurer, and Booker Pearson, manager. Four new directors were chosen, namely, L. E. White, O. H. Kirkham, S. H. Roark and James Dye.

DODGEVILLE, WIS.—The annual stockholders' meeting of the New Union Telephone Co. has been held recently and the following officers elected for the ensuing year are: president, John Row, Jr.; vice-president, Wm. Dickinson; secretary, E. A. Baker; treasurer, D. H. Williams; director, R. J. Rowe.

Underground.

ELGIN, ILL.—The Chicago Telephone Co. contemplates placing its wires in the business section, underground, and making all pole lines in alleys before 1919. The cost will be $100,000.

FRANKLIN GROVE, ILL.—The Farmers' Telephone Co. will place its telephone wires underground.

MONROE, MICH.—The city council has authorized the Michigan State Telephone Co. to put its wires in this city underground, the company to furnish a $10,000 bond for the proper performance of the work.

Miscellaneous.

LITTLE ROCK, ARK.—The Decatur Mutual Telephone Co. has surrendered its charter to the state.

PARIS, ARK.—Notice of dissolution and surrender of charter has been filed by the Logan County Telephone Co., which recently sold its holdings to the Citizens' Telephone Co. of this city.

LONG BEACH, CAL.—At a cost of over $100,000 a building is being constructed at this place which will serve as a home for the Long Beach branch of the Home Telephone & Telegraph Co. An almost entire new central office outfit will be installed, including switchboards, cables, etc.

MONMOUTH, ILL.—According to newspaper reports, 300 former subscribers of the Monmouth Telephone Co. in the vicinity of Lenox, contemplate forming a new telephone company.

QUINCY, ILL.—The County Home Telephone company has been sold by the Master in Chancery to R. Spencer, for $14,000.

INDIANAPOLIS, IND.—Articles of dissolution have been filed by the Peru Home Telephone Co. of Peru.

ROCKPORT, IND.—The Cumberland Telephone & Telegraph Co., of Nashville, Tenn., recently purchased the Luce & Ohio Township Telephone Co., with headquarters in this city, at receiver's sale for $28,000.

MORNING SUN, IOWA.—The Morning Sun Telephone Exchange, owned by P. A. Yobe, has been sold to Messrs. Henry form a stock company.

TOPEKA, KANS.—The public utilities commission has granted permission to Charles A. Kee, proprietor of the Kee Telephone Exchange at Sharon Springs, to sell the exchange to Ira Battles.

LACLEDE, MO.—H. E. Bundren, a salesman for a Chicago house, has purchased the Laclede Telephone Exchange from W. W. and C. E. Tracy. Mr. Bundren expects to improve the system.

FARGO, N. D.—The North Dakota Independent Telephone Co. is contemplating the organizing of several farmers' lines in the vicinity of Mott, N. D.

LEBANON, ORE.—C. H. Button, of La Grande, Ore., recently purchased the Lebanon Mutual Telephone Co. from W. D. Brown and Harry Witman. It is understood some construction work will be carried on.

BEAUMONT, TEXAS.—District Commercial Manager George J. Todd of the Southwestern Telegraph & Telephone Co., announced that his company has purchased the local telephone exchanges at Hemphill, Browndel, Brookland, Bronson, San Augustine and Center from the Sabine Valley Telephone Co.

GAINESVILLE, TEX.—The Peoples' Home Telephone Co. was purchased by the Grayson County Telephone Co. and F. W. Porter will be the president.

MARSHFIELD, WIS.—The Marshfield Rural Telephone Co. has filed an amendment to its articles of incorporation, increasing its capital stock from $5,000 to $10,000.